REPORT

OF THE

BOARD OF GOVERNORS

OF THE

UNIVERSITY OF ALBERTA

FIFTEEN MONTHS ENDED
MARCH 31, 1928

UNIVERSITY LIBRARY
THE UNIVERSITY OF ALBERTA

LIBRARY OF THE UNIVERSITY

To His Honour

The Lieutenant-Governor in Council.

Sir:

On behalf of the Board of Governors of the University of Alberta, and in accordance with section 31, subsection 2, of an Act respecting the University of Alberta, the undersigned have the honour to transmit to you through the Minister of Education, the Report of the University for the year closing March 31st, 1928.

The Report consists of two parts: Part I, the Report of the President on the academic work of the University; and Part II, the Financial Statement.

HORACE HARVEY,
Chairman.

ROBERT C. WALLACE,
President.

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PART I.

The Report of the President

To the Board of Governors
of the University of Alberta.

Gentlemen:

In accordance with the requirements of the University Act, section 66, subsection 7, I beg to submit herewith a report of the work of the University for the academic year ending March 31st, 1928, the twentieth annual report of the University, the eighteenth to your honourable body.

STAFF.

No changes have taken place in connection with the organization of the faculties during the current year. They stand as stated to you in the report of one year ago.

Professors	40
Associate Professors	18
Assistant Professors	15
Lecturers	10
Special Lecturers	2
Instructors	5
Demonstrators	2
Special Instructors	1
	93
Library—	
Librarian	1
Assistant Librarians	2
Sessional Help	2
Extension Department—	
Director	1
Assistant Director	1
Librarian	1
Lecturer	1
Industrial Laboratory—	
Director	1
Assistant	1
Department of Correspondence—	
Director	1

In addition to the above there were: one professor, two associate professors, thirteen assistant professors, eight lecturers, eighteen instructors, five demonstrators in the Faculty of Medicine not on the permanent staff, but who received a small honorarium for their services in the various laboratories and hospital departments.

In the Faculty of Law, besides the Dean and one full-time lecturer, there were two part-time lecturers and one part-time instructor who received honariums for their services.

Under the direction of the Research Council of Alberta two professors devote full time to research work. This work is carried on jointly by the Government of Alberta and the University, and for it special funds are provided.

Promotions of Staff.

The following promotions of members of the staff were made by the Board of Governors during the year:

Alan E. Cameron, D.Sc., from Associate Professor of Mining to Professor of Metallurgy.

John E. Bowstead, M.Sc., from Assistant Professor to Associate Professor of Animal Husbandry.

Robert D. Sinclair, B.S.A., M.S., from Assistant Professor to Associate Professor of Animal Husbandry.

Nathan B. Eddy, M.D., from Assistant Professor to Associate Professor of Physiology and Pharmacology.

Milton Ezra Lazerte, M. A., B.Educ., Ph.D., from Assistant Professor to Associate Professor of Psychology and Education.

Harry Randall Webb, M.Sc., from Lecturer to Assistant Professor of Civil Engineering.

Laurence Howard Nichols, M.A., from Lecturer to Assistant Professor of Physics.

Arnold Whitney Matthews, M.Sc., from Lecturer to Assistant Professor of Pharmacy and Materia Medica.

Sigvald Nielson, B.A., LL.B., from Lecturer to Assistant Professor of Law.

William Fulton Gillespie, M.B., M.A., from Instructor to Lecturer in Clinical Surgery.

Resignations of Staff.

Henry Marshall Tory, M.A., D.Sc., LL.D., F.R.S.C., F.R.H.S., the first President of the University of Alberta, resigned from the presidency after twenty years of service to become President of the National Research Council of Canada. Dr. Tory is to assume his new duties on June 1st, 1928.

James Bertram Collip, M.A., Ph.D., D.Sc., M.D., F.R.S.C., Professor of Biochemistry, retired from the headship of the Department of Biochemistry to accept the chair of Biochemistry in McGill University.

Miss Silver Dowding, M.Sc., Lecturer in the Department of Botany, resigned to pursue post-graduate work.

Miss Winifred Hughes, M.A., Instructor in Zoology, resigned from that department.

Miss Margaret Gold, M.A., resigned a lectureship in the Department of Classics.

Mr. G. B. Riddehough, M.A., resigned as Instructor in English.

Mr. J. E. Harris, B.A., resigned as Sessional Assistant in English.

New Appointments to the Staff.

Olaf Sverre Aamodt, B.S., M.S., Ph. D. (Minn.), to be Associate Professor of Genetics and Plant Breeding.

John T. Jones, M.A. (Alta.), B.A. (Oxon.), to be Assistant Professor of English.

Rev. Brother R. Phillip, M.A. (Tor.), Ph.D. (Catholic University of America), to be Assistant Professor of Philosophy.

Carson F. Morrison, M.Sc. (McGill), to be Sessional Lecturer in Civil Engineering.

Rev. Brother Aloysius, M.A. (Tor.), F.S.C., to be Lecturer in Spanish.

William P. Wallace, B.A. (Tor.), to be Instructor in Classics.

Alan Galbraith, B.Sc. (Alta.), to be Instructor in Mathematics.

Jean Murray, B.A. (Sask.), M.A. (Tor.), to be Instructor in History.

Wallace Sterling, B.A. (Tor.), to be Sessional Assistant in History.

John L. Hart, B.A. (Tor.), M.A. (Tor.), to be Instructor in Zoology.

Ewart Beresford, B.Sc. (Alta.), to be Sessional Assistant in Biochemistry.

REGISTRATION BY FACULTIES.

As distributed in the various faculties and schools the numbers are as follows:

Total Registration			1,536
1. Faculty of Arts and Sciences		712	
B.A. and B.Sc. in Arts	301		
B. Commerce	57		
B.Sc. in Household Economics	47		
B.Sc. in Pharmacy	12		
Special Students	34		
Graduate Students	59		
Graduate Special Students	6		
Arts for Medicine	11		
Arts for Law	6		
Arts for Dentistry	2		
Combined Courses	73		

Arts and Agriculture	5		
Arts and Law	24		
Arts and Medicine	40		
Arts and Applied Science	3		
Arts and Dentistry	1		
Summer Session (1927)		104	
2. Faculty of Applied Science			152
Civil, Mining, Electrical, Chemical		149	
Special Students		0	
Graduate Students		0	
Combined Courses		3	
Arts and Applied Science	3		
3. Faculty of Agriculture			249
Agriculture		54	
B. Household Economics		4	
Diploma Course		6	
Graduate Students		14	
Combined Courses		5	
Arts and Agriculture	5		
4. Faculty of Medicine			263
Medicine		147	
Dentistry		56	
Nursing Degree		6	
Arts for Medicine		11	
Arts for Dentistry		2	
Combined Courses		41	
Arts and Medicine	40		
Arts and Dentistry	1		
5. Faculty of Law			57
Law		27	
Arts for Law		6	
Combined Courses		24	
Arts and Law	24		
6. School of Pharmacy			38
B.Sc. in Pharmacy		12	
Diploma in Pharmacy		26	
7. Correspondence Courses		96	
8. B.D.		8	
9. School of Nursing		65	
Total			1,640
Less: (a) Duplicates registration in double courses		85	
(b) Other duplicates		19	
		—	104
Total			1,536

EXTENSION SERVICE.

The Extension Services of the University have become to an increasing degree the means of contact between the University and the people of the Province. The Extension Departmnt has worked as before through extension lectures, radio lectures, distribution of publications, assistance in debating and public discussion, correspondence courses, conferences, exhibits at fairs in the Province, distribution of agricultural mounts, travelling libraries, open shelf libraries, visual instruction through lantern slides and moving picture films and instruction in First Aid and Home Nursing. The radio service in particular is proving to be an increasing important medium of education, and the University authorities are much indebted to the many friends of the University who have given their services very generously either by addresses or by musical numbers. The University Radio Station has been, as during the previous year, on the air for two days during every week of the University year. A still further extension of this service for the benefit of school children is in contemplation.

The detail of the progress in instructional work in the various departments of the Extension Service will be found in the Report of the Director of the Department of Extension, which is printed under separate cover and may be obtained on application to the Department of Extension. The following statistics, to be found distributed through that Report, are assembled here and will be of interest as indicating the wide contact which the University now has through its Extension Services with the public at large.

Extension Lectures.

Number of lectures		334		
Aggregate attendance				38,353
Radio lectures (6 months)		206		
Total lectures		—	540	

Library Services.

Travelling Library Circulation		12,189		
Open Shelf Circulation		19,671		
Total books circulated		—	31,860	
Package Libraries for Debaters	501			
Other Package Libraries	551			
Total	—	1,002		
Plays for amateurs supplied to communities numbering		110		
Total		—	1,112	
			—	32,972

Visual Instruction.

Sets of lantern slides circulated		1,744		
Number of times used		1,901		

Aggregate attendance at lantern slide lectures		232,567	
Sets of moving picture films circulated	498		
Number of times used	634		
Aggregate attendance at moving picture programmes		106,461	
			339,028

Conference and Exhibits.

University Week for Farm Young People	111
Educational Exhibits Edmonton and Calgary Exhibitions.	

Instruction in First Aid and Home Nursing.

Number of persons instructed	523	
Certificates issued	454	
		523

Correspondence Instruction—Co-operative Marketing.

Number of Students	18
Papers corrected	98

Publications.

Press Bulletins:			
Number of bulletins issued	5		
Average circulation	3,600		
Aggregate circulation		18,600	
Agricultural Bulletins:			
Number sent out during year		16,779	
			35,379
Individual requests received	2,130		
Total number sent out since Jan. 1, 1923	59,494		
Bulletins distributed prior to Jan. 1, 1923 (approximately)	25,000		

Recapitulation.

Total aggregate attendance at lectures, lantern slide lectures, moving picture exhibitions, First Aid and Home Nursing classes, and Farm Young People Week	378,015
Total circulation of books, package libraries and plays	32,972
Total circulation Press Bulletins and Agricultural Bulletins	35,379

SUMMER SCHOOL AND SUMMER SESSION.

As in previous years, the University placed the buildings and equipment, during July and August at the disposal of the Summer School for Teachers conducted by the Department of Education.

The Summer Session of the Faculty of Arts in which courses leading to a degree were offered was continued. The registration was as follows:

	Men.	Women.	Total.
Registration	66	38	104

	Students.
Matriculation:	
German A	8
First Year Courses:	
French 1-3	6
Latin 1-3	12
Second Year Courses:	
Chemistry 1	5
English 2	10
Political Economy 1	6
French 5-4	10
History 2	5

	Students.
Senior Courses:	
Ancient History 52	16
Chemistry 52	6
Comparative Literature 51	5
Education 55	15
English 57	7
French 52	11
History 58	8
Mathematics 62	6
Political Economy 64	8
Psychology 55	12

STUDENT REGISTRATION

For the Academic Year Ending March 31st, 1928.

The following classification of the student body under various, heads: academic, social and religious, will give some indication of the manifold interests that enter into the University.

Registration by Years.

	Men.	Women.	Total.
First Year	175	48	223
Second Year	219	76	295
Third Year	168	70	238
Fourth Year	105	49	154
Fifth Year	46	3	49
Sixth Year	18	1	19
Graduate Students	59	20	79
Correspondence	46	50	96
B.D.	8	0	8
Short Course in Dairying	23	0	23
Diploma Course in Nursing	0	65	65
Summer Session	66	38	104
Special Students	16	18	34
Diploma Course in Agriculture	6	0	6
Agricultural Short Course	142	1	143
	1,097	439	1536

The Religious Affiliation of the Students in the University

As shown by their Registration Cards.

United Church of Canada	526
Presbyterian	216
Church of England	194
Roman Catholic	94
Baptist	62
Hebrew	39
Greek Orthodox	21
Lutheran	23
Christian Science	13
Greek Catholic	8
Church of Jesus Christ of Latter Day Saints	7
Church of Christ	5
Nazarene	4
Unitarian	4
Mennonite	2
Sikhism	2
Agnostic	1
Buddhism	1
Disciple of Christ	1
Evangelical	1
Moravian	1
Salvation Army	1
Seventh Day Adventist	1
Protestant	88
None	40
Not specified	181
Total	1,536

Registration of Students According to National Origin.

1. British Empire 1,123

(a) Canada 940

Alberta	424	Nova Scotia	41
Ontario	233	Quebec	20
Manitoba	93	P.E. Island	15
Saskatchewan	55	New Brunswick	15
British Columbia	41	Yukon	2

The 424 from Alberta were distributed as follows:

Edmonton	118	Leduc	8
Calgary	49	Lethbridge	8
Medicine Hat	29	Pincher Creek	8
Red Deer	12	Stettler	8
Wetaskiwin	12	Ponoka	7
Vegreville	11	Banff	6
Lacombe	9	Fort Saskatchewan	6

Claresholm	5	Olds	3
Innisfail	5	Bawlf	3
Lamont	5	Beaver Hills	3
Macleod	5	Bowden	3
Okotoks	5	Chipman	2
Gleichen	4	Coleman	2
Cayley	3	Innisfree	2
Didsbury	3	Isley	2
Forestburg	3	Nanton	2
Frank	3	Mundare	2
Granum	3	Spruce Grove	3
High River	3	Stavely	2
Kitscoty	3	Stony Plain	2
Beaver Lake	3	Vermilion	2
Camrose	3	Wieseville	2

and one each from the following 46 towns: Ardrossan, Bellevue, Blackfalds, Bon Accord, Bremner, Carsland, Carstairs, Content, Cravath Corners, Donalda, Duagh, Edson, Fishburn, Gilby, Halkirk, Hobbema, Irvine, Killam, Lanuke, Millet, Morinville, Musidora, Pakan, Raymond, Rimbey, Round Hills, Sedgewick, Shandro, Spring Coulee, Star, Stirling, Stonelaw, Strathmore, Strome, Taber, Three Hills, Tongue Creek, Wainwright, Walsh, Warspite, Warwick, Waskatenau, Westlock, Whitford, Willowbrook, Winterburn.

(b) Other parts of the British Empire 153

England	109	Newfoundland	2
Scotland	36	Australia	2
Ireland	24	Jamaica	1
Wales	4	New Zealand	1
India	3	Orange Free State	1

2. Foreign Countries 211

(a) United States (29 States) 161

Minnesota	20	Wisconsin	4
North Dakota	16	Connecticut	3
Iowa	13	Idaho	3
Illinois	11	Montana	3
Michigan	10	South Dakota	3
Washington	10	Texas	3
Nebraska	9	Colorado	2
Pennsylvania	8	Kansas	2
Ohio	6	Nevada	2
Oklahoma	6	New York	2
Oregon	5	Maine	1
California	4	Massachusetts	1
Indiana	4	New Jersey	1
Missouri	4	Utah	1
Vermont	4		

(b) Foreign Countries other than the United States 50

Russia	11	Roumania	2
Ukraine	7	Argentine	1
Japan	6	Belgium	1
Denmark	5	China	1
Norway	4	Germany	1
Holland	3	Persia	1

Poland	3
Austria	2
Portugese W. Africa	1
Sweden	1
3. Countries not specified	202
Total	1,536

Registration of Students According to Occupation of Parents.

Farmers and Ranchers	228
Merchants	162
Physicians and Surgeons	57
Real Estate & Ins. Agents	41
Managers	40
Railway Employees	40
Civil Servants	39
Ministers	35
Lumber Merchants	29
Contractors	28
Retired	27
Lawyers	24
Teachers	22
Engineers	24
Carpenters	19
Gentlemen	15
Dentists	13
Druggists	13
Inspectors	12
Buyers	11
Accountants	9
Travellers	9
Mechanics	8
Printers	8
Secretaries	8
Agents	7
Brokers	7
Clerks	7
Manufacturers	7
Stock Dealers	7
Veterinary Surgeons	7
Journalists	6
Millers	6
Miners	6
Painters	6
Business	5
Salesmen	5
Bankers	4
Bookkeepers	4
Judges	4
Proprietors	4
Tailors	4
Architects	3
Labourers	3
Live Stock Commissioners	3
Musicians	3
Policemen	3
Publishers	3
Registrars	3
Caretakers	2
Draymen	2
Electricians	2
Jewellers	2
Millwrights	2
Missionaries	2
Sheriffs	2
Shoemakers	2
Surveyors	2
Watchmakers	2
Artist	1
Auditor	1
Auctioneer	1
Barber	1
Blacksmith	1
Butcher	1
Carriage Builder	1
Display Man	1
Draftsman	1
Fishery Foreman	1
Furrier	1
Harness Maker	1
Landlord	1
Liveryman	1
Logger	1
Machinist	1
Mason	1
Master Mariner	1
Motorman	1
Pattern Maker	1
Planter	1
Plasterer	1
Plumber	1
Stonemason	1
Teamster	1
Upholsterer	1
Undertaker	1
Utilities Commissioner	1
Well Driller	1
Wire Chief	1
Deceased	142
Not specified	246
Total	1,536

ACADEMIC WORK.

The Convocation for the year was held on May 15th, 1928.

Total number of degrees granted:

In courses	192
Ad eundem	9
Diplomas in Pharmacy	21
Diplomas in Nursing	17
Diplomas in Agriculture	5

The reports of the various Deans on the work of their respective faculties indicate that the scholastic work has been maintained at a high standard.

In the Faculty of Arts there was an increased enrolment over last year of 13.5%.

A fluctuation of some interest is to be observed in the combined course in Arts and Medicine. For some time the tide has been running in the direction of the B.Sc., M.D. combination. During the past session, however, there occurred a decrease of ten in this course and an increase of four in the B.A., M.D. combination.

Commerce, which has been growing steadily, has possibly reached its maximum relative position.

Considerable development has taken place in the field of Household Economics. In 1925-26 there were twenty-two students registered in this course, and in 1927-28, forty-seven. This does not represent all the students taught in the department, as many women students choose Household Economics as a senior option in Arts. There are, in all, some seventy-six students receiving instruction in this department.

No less than five degrees are given under the auspices of the Faculty of Arts, viz., B.A., B.Sc. in Arts, B.Com., B.Sc. in Pharmacy, B.Sc. in Household Economics. Some of these courses may conceivably, as years go by, develop into faculties. In the meantime, the three last-named more or less professional courses have not had any formal organization of their own, nor hitherto has the number of students enrolled made such organization seem necessary, or even desirable.

The University is entering on a period of expansion, and it is perhaps worth serious consideration whether Household Economics and Commerce, while still functioning under the Faculty of Arts and Sciences, should not now be given a somewhat more formal type of organization than has sufficed till the present.

In the Faculty of Applied Science the registration this session has been the largest in the history of the faculty, with signs of approaching lack of accommodation and equipment in certain departments. The B.Sc. degree in Chemical Engineering was granted to four students for the first time.

There was an increased attendance in the Faculty of Agriculture this year.

The Department of Soils continued the work of the Provincial Soil Survey, in which they have been assisted by the Provincial Department of Agriculture and the Federal Department of Interior. The report of the Sounding Creek Sheet is just recently off the press.

In the Department of Field Crops more and more attention is being paid to the branch of Plant Pathology in order to cope with some of the diseases now causing serious loss in Alberta and other prairie provinces. Material assistance has been given by the National Research Council.

The Department of Entomology has continued the field work in connection with certain of the insect pests that are troublesome. Considerable attention is being given to the investigation of the wireworm menace. Here again assistance has been obtained from the National Research Council.

With regard to Agricultural Engineering, the head of the Department has been in constant receipt of requests for information concerning machinery. It has been thought well, this year, to make a particular investigation into the workings of the Combine Harvester and of a newly-invented stooker of local production, to determine definitely their intrinsic worth.

Short Courses in Dairying were given during the past winter as usual, but the attendance was not so large. The reason for this is undoubtedly due to a general falling off in interest in Dairying for the time being; this being coincident with an enhanced interest in beef cattle, and being caused largely by profitable grain farming during the past two or three years. Investigation work in connection with dairying problems is being carried on as reported last year. The maintenance of this department, and also that of Veterinary Science, has been materially assisted by the Department of Agriculture.

The Department of Animal Husbandry has a particularly good record this year. For the first time we have reached the point where we have been able to sell breeding stock in cattle. In addition to this a demand for breeding stock in connection with sheep and swine has been fairly active. The exhibit sent by the University to the Toronto Royal and the Chicago International Exhibitions was the most successful we have ever sent. All the four championships and the grand championship were won at the Royal. Two first placings were won at the International, and also the Shorthorn championship. This record has, perhaps, never been equalled by any one exhibitor in the past, and is not likely to be duplicated for a long time to come.

In the Winter Short Course, conducted in February, one hundred and forty-three registered, coming from all over the province. The interest and appreciation shown was most gratifying. It would appear that this line of work is capable of further development.

The members of the staff of the Faculty of Agriculture have given two lectures per week over CKUA from the time the station was established up to the present. This has resulted in a splendid contact with the farmers of the province. It has also resulted in a great increase in correspondence.

Three new bulletins have been issued this year—"Soil Survey of the Sounding Creek Sheet"; "Some Experiments with Bacon Hogs"; and "Some Power Problems on the Farm." These bring the total issue of such publications up to seventeen bulletins, four circulars and three research bulletins. Besides these, there were issued some Press bulletins, and several articles were furnished to "Scientific Agriculture," the official journal for Canada.

During the present year there has been a slight falling off in the registration in the straight Law courses, but this is counter-balanced by an increase in the numbers taking the combined course. In view of the fact that this is the first year in which an admission requirement of the two years in Arts has been imposed, the freshman registration this year is gratifying. From the number of students now taking the preliminary years of the Combined Course, it would appear that the registration in Law for the next two years would be relatively stable. Present registration in the Combined Course and in the straight Law course indicated that the number of graduates in Law during the next three or four years will be about twelve each year. This is a satisfactory number, inasmuch as present indications suggest that that number can readily be absorbed by the profession.

The prelegal educational qualifications of the present freshman class is the best in the history of the faculty. One hundred per cent. of the members of the class have degrees in Arts, or are taking the Combined Course in Arts and Law. Eighty-five per cent. of the students taking the work of the third year have Arts degrees. Since the granting of degrees for full-time work in Law, sixty per cent. of our graduates in Law have had Arts degrees, or their equivalent.

The concurrent raising of the entrance requirement to two years in Arts by the Law Society and by the University is having the effect of causing practically all persons entering upon the study of Law to come to the University.

Since the granting of the degree of LL.B. for full time work done in the University, eighty-seven persons successfully completed the work of the three years. Of these, seventy-eight are engaged in legal work.

Any misgivings which may formerly have existed as to the absorption of our graduates in Law are now without foundation.

At present it would appear that the demand for our graduates exceeds the supply.

The registration of students engaged in graduate work has stood during the past session at eighty-two, as compared with seventy-two two years ago.

Considering the relatively limited constituency on which we have to draw, it is a matter of great satisfaction that the number of our graduate students maintains itself at such a high level. In proportion to the total enrolment, British Columbia stands first with 7% of graduates, second are Toronto and Alberta with 6% each. Sixteen women and sixty-seven men are now registered for the degrees of Masters of Arts, Master of Science, and Bachelor of Education.

FRESHMAN COMMITTEE.

The Freshman Committee has continued to act in the position of personal advisers to the students who come to the University for the first time. Freshman students in many instances are found to be undecided as to the course which they can best follow at the University and the profession which they desire to adopt. Personal contact with the members of the staff comprising the Freshman Committee, and the advice which such staff members are in a position to give, does much to prevent a certain wastage which might otherwise occur in the early years of University life. The Committee serves as well to check up at an early date students who may not take sufficiently seriously the class-room work of the University and to advise and, if necessary, to request that delinquent students withdraw from University classes.

STUDENTS STUDYING ABROAD.

A number of students of the University of Alberta are studying in foreign universities, some as the result of scholarships awarded within the province and others having obtained scholarships or fellowships from the universities where they are now pursuing a course of study. The following list of those studying and the auspices under which they are studying is an indication of the growth of this tendency on the part of our Honour students:

Under the Rhodes Scholarship system a three years' course of study has been made available to Ronald Martland, B.A., LL.B.

Miss Marian Gimby, B.A., is pursuing post-graduate study at Oxford University, having been granted a scholarship by the Imperial Order of the Daughters of the Empire.

Miss Silver Dowding, M.Sc., is pursuing a course of study at the University of London by reason of a scholarship awarded by the Federation of University Women in Canada.

Mr. Edward Taube, B.A., is studying at the University of Wisconsin under the German Lehrer-Seminar Fellowship.

A number of our graduates in Agriculture are taking post-graduate work in American universities. Mr. L. E. Kindt, B.Sc.; Mr. B. H. Wilson, B.Sc.; and Mr. W. M. Martin, M.Sc., are at the University of Minnesota. Mr. W. H. Cook, M.Sc., is attending Stanford University, California. Mr. A. E. Clark is studying at the University of Wisconsin, and Mr. G. F. H. Buckley, M.Sc., at the University of California.

Mr. J. A. Anderson, M.Sc., is attending the University of Leeds, England; Mr. R. H. Bedford, M.Sc., McGill University, Montreal; and Mr. A. J. V. Lehmann the University of Toronto, Toronto.

Mr. Walter Little, an undergraduate, has been given a year's supervised training by the Dean of Windsor, Windsor, England.

REPORT OF THE PROVOST WITH REGARD TO STUDENT GOVERNMENT AND DISCIPLINE.

Student Government.

During the past session there has been considerable dissatisfaction among the students with their present form of government. The main reason is that the student body has now become too large to function as a whole. It has become increasingly difficult to obtain an adequate attendance at the meetings of the Students' Union, and even when it is possible to get a well-attended meeting, there is not sufficient time to discuss in a thorough way the various problems presented by the Students' Council for consideration. For some time the advisability of dropping the present system, and establishing a representative form of government has been under discussion, and at the last meeting of the Students' Union a committee was appointed to consider the whole question of re-drafting the Constitution. It is hoped that during the coming session a new scheme of government will be worked out, which will function more satisfactorily.

Discipline.

The only difficulty to be mentioned in connection with discipline is the dissatisfaction which has grown up in regard to the Students' Court. The opinion among the students has been fairly generally expressed that the Students' Court has recently failed to function as an effective instrument of self-discipline. For this reason the whole question of student discipline is under consideration by the Students' Union, and recommendations from the Union will be presented to the University during the coming session.

There have been, during the session, no cases of discipline serious enough to require special report.

The House Committee has done its work particularly well. It has endeavoured to set high standards in the discipline and social life of the Residences, and has received the loyal support of the students.

During the year several much appreciated donations were received by the Library.

The Students' Law Club donated $15.00 towards the purchase of a set of "Trials."

The Council of the Academy of Medicine has undertaken to donate the sum of three hundred dollars for the purchase of books for the Medical Library.

The list of additions to the Medical Library since the catalogue issued to the members of the profession in 1926, was printed and sent out so that all practitioners in the province have a list of the books accessible to them in the University Library. There has not been any very strong call for service by the Medical Library from the province, but it is expected that as the Medical Library develops this will increase.

PRIZES, SCHOLARSHIPS AND GIFTS.

The McLaren-Cook Memorial Prize in Household Economics.

A prize to the value of $15 in books has been offered by Miss Janet Cook and Assistant Professor Cook, to be awarded to the student who has—

(a) the best record in the subjects of Household Economics of the final year, provided a standing of not less than 85% is obtained in these subjects;

(b) satisfactory standing in the other subjects of that year.

Ministere des Affaires Etrangeres Bronze Medal.

A bronze medal in French offered by the French Consul for western Canada, Mr. Paul Suzor, and awarded to the undergraduate student enrolled in the senior French course who takes the highest standing in a special examination covering oral French and free composition in French.

Gifts.

The Canadian Institute of Mining and Metallurgy presented a plaque in memory of Willet Green Miller, a member of the Canadian Institute of Mining and Metallurgy, 1898-1925, and President 1908-9, Provincial Geologist for Ontario, 1902-25.

The Edmonton Battalion Reserve Militia presented a cheque for $380.64 to be used as an endowment fund for the War veterans now being treated in the University Hospital.

From an anonymous donor the University received about twenty-five hundred volumes pertaining to German literature, life and kindred topics, to constitute the nucleus of a departmental library.

A notable gift was that of the Covered Rink, which was completed and presented to the University by the student body last December. The rink was erected from funds contributed by the students and

MEDICAL SERVICES.

During the session the usual high standard of the Medical Services was maintained.

Ninety-five cases were treated in the Infirmary, of which sixty-seven were resident and twenty-eight non-resident students.

The resident physician gave 2,512 treatments for various kinds of ailments; of these, 1,980 were to resident students and 532 to non-resident students.

Some of the infirmities treated were as follows: Adenitis, Appendicitis, Bilious Attack, Bronchial Catarrh, Bronchitis, Boil, Burn of Hand, Chronic Appendicitis, Constipation, Conjunctivitis, Corn, Coryza, Diaphragmatic Pleurisy, Herpes Zoster, Hyperpyrexia, Indigestion, Influenza, Intestinal Colic, Injury to Abdomen, Injury to Ankle, Injury to Foot, Injury to Knee, Injury to Leg, Laryngitis, Muscular Rheumatism, Neuritis, Orchitis, Pityriasis Rosea, Pleurisy, Pyelitis, Septic Face, Septic Mouth, Tonsilitis.

THE LIBRARY.

The report of the Librarian shows that during the year the work of the Library has gone on without interruption, and as has been usual during the past few years, there has been great pressure on the space available for readers. The reading-room has been very well used, and in the morning hours especially there has often been no seat vacant, and students have sought places elsewhere for study.

The accession number of 32,577, as against 30,606 last year, showing an increase of 1,971 volumes.

The work of binding has been continued, and a great deal of improvement has been effected, making the material in the Library of easier access to readers. Since the binder began his work he has bound for the Library over 2,500 volumes, and has reduced an immense amount of loose material to bound volumes. There has been done the equivalent of about five years' binding, and it may be expected that when all arrears are overtaken there will be need to bind at least 500 volumes each year.

Certain replacements of reference books have been effected, and it must be remembered that in the years of use many volumes are being worn out. This loss is not serious, as in many cases the old books have to be replaced by new editions, but it is a factor to be borne in mind as a perpetual charge on the resources of the Library.

In spite of the fact that last year 350 feet of new shelving was erected, it is necessary now to increase the occommodation for books. The Law Library, the Medical Library, the Agricultural Library, and the main stack room, all require more book room, and this is about the last possible extension of the shelving without cutting in on the space for readers.

citizens of the province generally. The Government assisted in the meantime in financing the enterprise on the understanding that the remainder of the capital cost would eventually be covered from Students' Union fees.

PUBLICATIONS BY THE UNIVERSITY STAFF.

The Department of Animal Husbandry.

By Professor J. P. Sackville: "A Study of some Problems in Bacon Hog Production," University of Alberta Agricultural Bulletin No. 15.

The Department of Bacteriology.

By Dean A. C. Rankin: "The Report of the Alberta Committee on Tuberculosis of the National Research Council on B.C.G. Vaccine."

The Department of Botany.

By Assistant Professor E. H. Moss: "The Uredinia of Cronartium Camandrae and Melampsora Medusae," Mycologia XX, 36-40, 1928; "The Hanstorium of Cuscuta Gronovii," Scientific Agriculture VIII, p. 461, 1928.

The Department of English.

By Professor E. K. Broadus: "Thomas Fuller: Selections," edited by E. K. Broadus, The Clarendon Press, Oxford, 1928.

By Professor R. K. Gordon: "A New Composition for Secondary Schools," Copp, Clark Company, Toronto. This is for use in Grade IX, X, XI, in Alberta High Schools.

Department of Entomology.

By Professor E. H. Strickland: "Can Birds Hold Injurious Insects in Check?" Scientific Monthly, January, 1928.

Department of Field Crops.

By Professor R. Newton and Mr. W. H. Cook: "An Effective Laboratory Dryer," Plant Physiology, Vol. II, No. 3, 359-360, 1927.

By Professor R. Newton, Mr. W. H. Cook, and Mr. J. G. Malloch: "The Hardness of the Wheat Kernel in Relation to Protein Content," Scientific Agriculture, Vol. VIII, No. 4, 205-219, 1927.

Department of Geology.

By Professor John A. Allan: "The Relation of the Geology to the Soils in the Sounding Creek Sheet," University of Alberta Agricultural Bulletin, No. 16, December, 1927, Appendix 2, pp. 52-66; "Geological Problems of the Spray Water Power Project in Alberta," The Engineering Journal, October, 1927.

By Dr. R. L. Rutherford, Assistant Professor of Geology: "Mammal Tracks from the Paskapoo Beds of Alberta" (with L. S. Russel), American Journal of Science, Vol. 15, p. 262, March, 1928.

Department of History.

By Professor A. L. Burt: "A New World, or the League of Nations," the League of Nations Society in Canada, pub. July, 1927; "Review of Knaplund, Gladstone and Britain's Imperial Policy," Canadian Historical Review, September, 1927; "On the Study of History," University of Alberta Press Bulletin, March 14, 1928.

By Associate Professor M. H. Long: "Changing Factors in British Imperial Policy," Foreign Affairs, January, 1928.

Department of Modern Languages.

By Dean W. A. R. Kerr: "Anthology of French Canadian Prose," Longmans, Green and Company, Toronto.

Department of Political Economy.

By Professor D. A. McGibbon: "The Retirement of Canada's Public Debt," Journal of Canadian Bankers' Association, January, 1928.

Department of Physics.

By Dean R. W. Boyle: "Transmission of Sonic and Ultransonic Waves through Partitions," Nature, January, 1928.

By Dean R. W. Boyle and Mr. W. F. Rawlinson: "Theoretical Notes on the Passage of Sound through Contiguous Media," Transactions of the Royal Society of Canada, January, 1928.

By Professor Stanly Smith: "Some further Spectral Lines of Trebly Ionised Germanium," Nature, November, 1927.

By Associate Professor R. J. Lang: "The Spectra of Gallium, Germanium and Indium," Physical Review, December, 1927; "The Spectra of Singly and Doubly Ionised Germanium," National Academy of Science, January, 1928.

By Otto Laporte and R. J. Lang: "The Second Spark Spectrum of Zinc" (Zn III), Physical Review, October, 1927.

The Department of Physiology and Pharmacology.

By Mr. J. P. Quigley, lecturer in Physiology and Pharmacology: "Reactions of an Elasmobranch (Squalus Sucklii) to Variations in the Salinity of the Surrounding Medium," Biological Bulletin, liv. 165, 1928.

The Department of Soils.

By Dr. F. A. Wyatt and Dr. J. D. Newton: "Alberta Soil Profiles," in abstracts of Proceedings of First International Congress of Soil Science. (Com. V and VI) June 13-22, 1927, Washington, D.A.

By Dr. F. A. Wyatt, Dr. J. D. Newton, and Dr. J. A. Allan, with T. H. Mather, J. L. Doughty and A. S. Ward assisting: "Soil Survey of Sounding Creek Sheet," University of Alberta Agricultural Bulletin No. 16, December, 1927.

The Scientific and Industrial Research Council of Alberta.

"Bituminous Sands of Alberta, Part I," and "Bituminous Sands of Alberta, Part II," by Dr. K. A. Clark and S. M. Blair, Report No. 18, Scientific and Industrial Research Council of Alberta.

THE UNIVERSITY HOSPITAL.

The work during the year in the University of Alberta Hospital has been of a highly satisfactory nature. The services in all departments have increased—in Operations 12%, in X-Ray examinations and treatments 40%, in Physiotherapy treatments 218%, and in Hydrotherapy 17%. This increase was absorbed without increasing the personnel of the respective departments.

The total number of hospital days for the year was 62,517, an increase of 8% over last year. There were admitted 119 more provincial cases, 197 less city cases, and 7 less cases from outside the province. One hundred and forty indigents were cared for, with a loss to the Hospital of $10,263.68. The number of Orthopaedic patients days was 9,118, with a loss of $13,677.00.

There are two distinct needs in the University Hospital which are the more pressing as time goes on. The first is greater accommodation for clinical material. This necessitates the still larger number of indigent patient cases in the Hospital with a necessarily increasing loss to the Hospital financially on this account. The space can only be obtained by increasing the Hospital accommodation, and the question of additions to the Hospital must now be faced in the interests of the clinical departments of the University. The second need, no less pressing, is for residence accommodation for the nurses. The Superintendent of Nurses, in her report, points out that there was a total of 1,384 days of illness in the Nursing School during the year, an increase of 484 days over the previous year. The analysis of these figures shows that the nurses are working under heavy strain, and with the scattered accommodation now provided at considerable distance from the Hospital, do not have the necessary rest and recreation which their work demands. It is clear that arrangements must be made without loss of time for a Nurses' Home in close proximity to the Hospital itself.

In the Out-Door Department, 414 patients were admitted, 123 to the University Hospital, 86 to the Royal Alexandra, 65 to the Misericordia, and 140 to the General Hospital. From these figures it is clear that a great deal of teaching material is lost to the University Hospital owing to lack of space and consequent inability to admit patients from the Out-Door Clinic in the city. With the establishing of a dispensary in connection with the Out-Door Clinic a great deal of the difficulty in connection with the work would be removed.

Notwithstanding the fact that the University Hospital is a closed hospital, with one of its main services that of supplying necessary clinical material in the training of medical students of the University, the cost of operation compares favourably with hospital practice in general. The cost per patient for ward services only averages $2.34 per day. The average per day available for the Hospital for ward services only from all sources is $1.91 per day.

PROVINCIAL LABORATORY.

The work carried on in the Public Health Laboratory covers a wide range. The total number of examinations of various kinds carried on during the year was 29,193. The accompanying table shows that the total value of these examinations on the basis of regular charges made elsewhere is $135,519, an increase of $3,627 over the previous twelve months. The vote for the year to the Provincial Laboratory was $34,500. There is, therefore, carried on by the Provincial Laboratory a service to the province of a value exceeding by over $100,000 the actual amount paid for these services. Apart from this, the value of centralization of all the pathological, histological, bacteriological and chemical work connected with the health of the citizens of the province is evident. The actual chemical examination of water and milk was carried out by the Provincial Analyst.

APPENDIX.

Estimated Commercial Value of Work if Minimum Charges Were Made.

Material.	Number of Specimens.	Price per Specimen.	Total.
Sputum	596	$ 2.00	$1,192.00
Diphtheria	912	2.00	1,824.00
Typhoid Fever	254	2.00	508.00
Waters	1,309	15.00	19,635.00
Mothers' Milk	52	2.00	104.00
Milks	924	5.00	4,620.00
Miscellaneous Examinations	2,273	5.00	11,365.00
Smears for the Presence of the Gonococcus	2,194	2.00	4,384.00
Bloods for the Wassermann Test	10,352	5.00	51,760.00
Pathological Histological Material	5,475	5.00	27,375.00
Medico-Legal Examinations	8	5.00	40.00
Icterus Index Determination	2,362	1.00	2,362.00
Van Den Bergh Determination	2,362	3.00	7,086.00
*B.C.G. Vaccine (20cc quantity)	*2,360cc	3.00	354.00
*Typhoid Vaccine (25cc quantity)	*4,960cc	5.00	990.00
*Autogenous Vaccine (25cc quantity)	*3,200cc	15.00	1,920.00
Total	29,073		$135,519.00

Total Value, 1926	$131,892.00
Total Value, 1927	135,519.00
Total Increase	3,627.00

*Not included in total.

Pressing Requirements.

The accommodation for students in the Library, in the classrooms in the Arts Building, and in the laboratories in Engineering and Physics is now, with increasing registration, inadequate. The Library is overcrowded to the extent that students cannot now find sufficient accommodation for study in the library rooms. The overcrowding necessary to accommodate the students even in part has made the ventilation problem, always a difficult one, almost insupportable. The accommodation for books in a library which has not quite kept pace with the demands of the departments is already overtaxed. Drafting-room accommodation, in particular, is such that the question of using Convocation Hall for this purpose has been seriously contemplated. There seems now no doubt that the increase in registration in Applied Science will be continued for several years to come as the country faces a period of expansion and need for the trained engineer. Relief will best be obtained by the erection of a Library Building to house as well the Extension Services, the Law School and senior classes in English and History. The University is in all probability faced with a period of continuously increasing registration. In Manitoba, with a population not much greater than Alberta, there is a university population of approximately one thousand more than Alberta. This is an indication of what has to be provided for in the future. It is necessary that attention be seriously directed to a building programme to meet the needs particularly of the departments referred to above.

In the Hospital as well, as pointed out in the Report, there is need for increasing clinical material, necessitating an addition to the University Hospital and for a Nurses' Home. The importance of both additions is set forth in detail in the paragraph under "The University Hospital." The Faculty of Medicine, in combination with the University Hospital, has acquired a standing in Canada very gratifying to the University. There is urgently needed, in order that that standing may be maintained and enhanced, increased clinical accommodation in the Hospital. The strain under which the nurses now carry on with accommodation scattered at some considerable distance from the Hospital itself, must be relieved before the session of 1929 is entered. This can only be done by obtaining satisfactory accommodation for the nurses in one place and near the Hospital.

In the Faculty of Agriculture, the Department of Poultry is not yet on a basis adequate to meet the provincial needs. An increase of staff and the necessary accommodation must be looked forward to in the immediate future. An extension of the services of the Horticultural Department as well, with increased ground and, if possible, an articulation with the work being carried on in the irrigation areas of Alberta in Horticulture, must be planned for the immediate future.

With the building of the Normal School on the University Grounds, the space needed for the Department of Field Crops and Animal

Husbandry on the main grounds is being further restricted. It is necessary to look forward to the moving of the Animal Husbandry Department to the South Farm. From the standpoint of the Hospital as well, it has now become a matter of serious moment that the Animal Husbandry Department should be moved from its present location. There is no doubt that the near vicinity of the farm buildings and manure heaps to the Hospital has added seriously to the fly nuisance in that area in recent years. In order to accommodate the Animal Husbandry Department at the South Farm it will be necessary to acquire greater acreage.

During the period of financial stringency the capital outlay in connection with the University was of necessity curtailed. The demands for university training have nevertheless gone forward. It is necessary now, in facing a period of greater expansion generally, to face seriously as well the clearly expressed needs of the University in connection with its services in the interests of the province and of the education of young men and women for the service of the province.

REPORT OF THE COLLEGE OF AGRICULTURE

For the Year Ended March 31, 1928.

The report of the Faculty of Agriculture was submitted at the close of the year 1927 to cover the full calendar year. The present report includes practically that report, with a few items that have been added as belonging to January, February and March of 1928. The report on the experimental work in Field Crops has been changed accordingly, and a similar change will be noticed in connection with the live stock report. The only other added item is the one dealing with the short course put on under the Faculty of Agriculture. Otherwise the present report is a repetition of the report of 1927.

There has been a gratifying increase in the attendance at the College of Agriculture for the fall term of 1927. There had been a slight falling off the previous year, as reported in 1927, but this has been more than made up, the attendance now being larger than for some years past. The registration is as follows:

First year	13
Second year	16
Third year	15
Fourth year	10
Combined courses	20
Graduate work	6
Diploma students	6
Domestic science	5
Total	91

Graduates from the Schools of Agriculture enter our four-year course in the second year. Eight students have so registered this year. There has been a serious falling off in the attendance of students from the schools. Students from the schools have been among the most successful of our graduates. It is highly desirable that some means be found to induce a reasonable number of these boys to come on for degree work. Perhaps an improvement in financial conditions will result in an increased attendance from this source. Last year we put on a Diploma Course for five months without fee or entrance requirement other than that the student registering should have come from a School of Agriculture, or have had equivalent training. This course was put on at the request of the Department of Agriculture to meet the possible needs of such students who might wish to establish a University connection, but who had no intention of entering degree work. Last year only two students registered; this year six have registered. We hope to see more boys take this advantage to establish a University acquaintance.

A statement is hereby submitted in connection with our graduates in Agriculture to date from the University:

Since 1918, when the first class was graduated, one hundred and twenty-one degrees in Agriculture have been granted by the University of Alberta. According to the lines of work which they are following, the graduates may be classified as follows:

Agricultural Engineers	1
Agricultural Bacteriologists	3
Agricultural Chemists: Soil	7
Plant Biochemistry	4
Agricultural Journalists	3
Agricultural Missionary	1
Animal Husbandry	6
Colonization	1
Commercial	4
Dairy Husbandry	5
Entomology	2
Economics (Agricultural)	4
Farmers	42
Field Husbandry	15
General Science	4
Horticulture	3
High School Teaching (including Agriculture)	2
Irrigation	1
Medicine	2
Plant Breeding	3
Plant Pathology	2
Field Work (Agricultural Extension)	4
Theology	2

It is interesting to note that of the one hundred and twenty-one graduates, only eight are following pursuits not agricultural, the remaining one hundred and thirteen being directly connected with either the practice or science of agriculture. Of the hundred and thirteen graduates engaged in agricultural work, forty-two are actual farmers, forty-one of these farming in Alberta. It may be stated that thirty-four per cent. of our agricultural graduates are "on the land" at the present time. The graduates point with pride to the fact that fifteen of their number are in the employ of the Provincial Department of Agriculture, fourteen of these being on the staffs of the Schools of Agriculture. Eleven graduates are employed by the various divisions of the Dominion Department of Agriculture. May I also point out that of the one hundred and twenty-one graduates, only five are earning their living in countries other than Canada.

Apropos of the work of the agricultural graduates, it would seem worth mentioning that in addition to the students who actually graduated, and not including those in agricultural classes at the present time, seventy-five men have taken one year's work; fourteen have been in attendance for two years, and two for three years. While the graduates do not include these men in their numbers, they feel that this element is making a worth-while contribution to agricultural improvement in the province.

The first Short Course put on by the Faculty of Agriculture was of two weeks' duration, from January 24th to February 3rd. This course was made up of lectures in subjects directly agricultural, including six evening lectures. The attendance was 143, and was representative of all parts of the province generally. The success of this course was most gratifying to the members of the Faculty, and so much appreciation has been expressed by those attending that it has been deemed advisable to repeat the course during the coming year. It would appear that before long it will become necessary to put on at least two Short Courses.

The reports of the directly Agricultural Departments are hereby submitted.

DEPARTMENT OF ANIMAL HUSBANDRY.

Much of the time of the teaching staff during the academic year has been taken up with the preparation and presentation of lectures and demonstrations, in which the object is to cover as completely as possible the various subjects in Animal Husbandry that are recognized as fundamental at an institution of this kind. This is considered the most important phase of the work of the Department. While no new courses have been offered, it is necessary each year to revise and reconstruct the existing courses in order to bring them up to date. In addition to the twelve undergraduate courses, there are two advanced courses offered to students who wish to take up graduate work in Animal Husbandry. During the present year two students have been enrolled for this work leading to the Master's Degree.

A second and important phase of the work of this Department is the conducting of experimental and research work. A considerable portion of the time of the staff during the academic year and the major portion of the time during the intermission is taken up with the directing and interpreting of experiments. The purpose of this line of endeavor may be considered two-fold: (1) making available first-hand data to supplement the teaching courses, and (2) the securing of reliable information on some of the fundamental problems affecting the live stock interests of the province.

With a view to setting forth the lines of work that are being undertaken at the present time, the following brief statement is submitted:

Beef Cattle.

One year's work was completed in 1927 to ascertain the relative values of oat hay and oat silage as a roughage for wintering breeding beef heifers. The results show that oat silage has a considerably higher feeding value than oat hay for this purpose; the rate of gain was 31.6 per cent. higher in the case of the silage fed group. Based on feed prices used during the winter of 1926-27, it cost $6.00 per hundred for gains in the lot receiving oat silage, and $12.81 for those fed oat hay. Valuing oat hay at $12.00 per ton, oats at 48 cents per bushel, and barley at 56 cents per bushel, oat silage had a value for wintering breeding heifers of $11.80 per ton.

A series of experiments are being commenced this year to obtain information on the following problems as related to beef production:

1. A comparison of steers and heifers in the feed lot.

2. The value of minerals in finishing steers. The above two projects are a continuation of work started two years ago.

3. The degree of finish in relation to economy of gains and suitability for the regular channels of trade.

4. The relative economy of finishing calves as compared with older animals.

5. Suitable fattening rations for calves, with special reference to self-feeding.

Dairy Experiments.

The establishment of a beet sugar factory in southern Alberta has meant that a considerable quantity of sugar beet by-products are now available for feeding. One of these—"Betalasses"—is being offered as a feed for dairy cows, and it was deemed advisable to conduct a feeding experiment in which the value of this by-product could be compared with other carbonaceous grains. In this trial it was found that one hundred pounds of "Betalasses" is equal in feeding value to one hundred and twenty-eight pounds of barley, or one hundred and forty-two pounds of oats for milk production.

Another dairy cattle feed—wet brewers' grains, a by-product of the breweries—can be obtained in certain sections of the province. As very little information on the value of this particular product is published, a test was commenced this year with the object of determining the feeding value for milk production. Based upon the average prices of feeds, one ton of wet brewers' grains had a value of $8.21 for milk production. This price should be regarded as the value of brewers' grains laid down at the farm.

Swine Experiments.

During the past year an extensive programme of swine feeding experiments has been conducted. In all, thirty groups of pigs were fed in summer experiments with spring farrowed pigs, and fourteen groups in winter experiments with fall farrowed pigs. The problems dealt with were those in connection with which swine producers seemed to manifest a desire for specific information. Among the problems treated the following might be mentioned:

1. A consideration of suitable substitutes for skim-milk and the comparative value of such substitutes.

2. The value of mineral mixtures for spring farrowed pigs in dry lot and on pasture, and the value of similar mixtures for fall pigs.

3. The suitability of various feed mixtures for pigs after weaning.

4. The value of standard recleaned screenings in the feeding of both fall and spring farrowed pigs.

5. A study of the causes of soft pork or soft fat in the hog carcass.

6. The cost of production of fall pigs in Alberta.

7. The value of sunlight and cod liver oil in preventing stiffness and rickets in fall pigs.

The results secured from mineral feeding indicate that when dairy by-products are not being fed, the use of minerals will result in an increase of twenty to thirty per cent. in the rate of gains and a decrease of approximately twenty per cent. in cost of grains. When dairy by-products or tankage are fed in sufficient volume, the mineral requirement seems to be taken care of without the use of a mineral supplement. In connection with a study of skim-milk substitutes, it has been found that tankage can be relied upon, and that a mixture of tankage, alfalfa meal and oil meal gives excellent results. Soft pork investigations failed to reveal any connection between killing weight and firmness of carcass. The carcasses from pigs marketed at the lower limit of standard bacon weights were as firm as those from pigs marketed at the intermediate or maximum weights for bacon hogs. Increasing the proportion of barley in the ration did not lead to a higher proportion of soft carcasses. Standard recleaned screenings, when fed either as a sole grain or in combination with oats and barley, provided satisfactory and reasonably economical gains in both spring and fall farrowed pigs.

Experiments in fall pig feeding yielded further evidences that fall pigs can be profitably grown in Alberta, and indicated that careful consideration must be given to the use of proper protein and mineral supplements in winter pig feeding. Evidence has been secured that sunlight plays an important part in maintaining normal thrift in fall pigs. This problem is being studied further at the present time.

Sheep Experiments.

A considerable amount of valuable information was secured during the past year in connection with management methods in the lamb flock. Two methods of docking—the use of the searing iron and the sharp knife—were compared, different methods of castration were tested, and the effect of grain feeding while on pasture was studied. This work also lent itself to statistical growth study with reference to such factors as influence of sex and birth weights on subsequent development, and a comparison of the growth in the case of singles, twins and triplets.

In the above trial it was found that the use of the sharp knife gave slightly better results than the use of the searing irons. More data will have to be accumulated from later trials to reach any authentic conclusions in regard to the other problems and studies involved.

The fourth year's trial comparing pastures for ewes and suckling lambs was conducted. Only three pastures were compared, rape, oats and a mixture of oats and rye. The results secured correlated with those of 1926, and showed that for producing gains in ewes, rape ranked first, oats and rye pasture second, and oats third. For the lambs, rape again ranked first, with very little difference between oats and oats and rye.

The project commenced in 1921 comparing the practice of breeding ewe lambs with that of breeding ewes for the first time as shearlings is still in progress. Much valuable data have been accumulated, and it is hoped that with the addition of the data secured during the next two years, a publication of the results will be warranted.

There is still a question as to whether or not a protein or mineral supplement need be supplied to fattening lambs fed the usual carbonaceous feeds of central and northern Alberta. A trial conducted this past year with three groups indicated that a mineral mixture or a protein supplement when added to the oat and barley grain mixture induced more rapid gains.

Further tests are required in order to obtain more definite information in connection with the value of these two supplements for fattening lambs.

Feeders' Day.

The annual "Feeders" day, or Farmers' day, was held again in April of last year, following the completion of the winter feeding trials. The usual good attendance of well over two hundred farmers was maintained, and the inspection of the experimental animals, together with the discussion of the results of the experimental work undertaken this year, created a great deal of interest. This event affords an exceptionally good opportunity to get in close contact with the livestock men of the province, and to disseminate in a practical way the information that is being obtained from the results of the experimental and research programme that has been in progress for some time.

Extension Service.

During the past twelve months the volume of correspondence has grown considerably. For the most part the letters that go out from this office are in reply to inquiries received from farmers. These inquiries are for specific information on the feeding and general care of all classes of live stock, questions relating to breeding problems, treatment of various ailments and inquiries in connection with the most suitable breeds of live stock for certain conditions. In several cases these letters involve two to three pages, and a careful review and discussion of various phases of our experimental work in order to set forth clearly and authentically the information desired. A conservative estimate of the number of people who personally call on the Department of Animal Husbandry each year to obtain definite information would be well over one thousand. In addition, the number of telephone calls from farmers asking for advice would be at least two hundred each year. Members of the staff assisted at four farmers' short courses at the following places: Lethbridge, Raymond, Ponoka and High River. Judges for live stock at eight exhibitions were supplied this year at Calgary, Edmonton, Red Deer, Camrose, Goose Creek, Provost, Killam and Lethbridge. Various conventions, breeders' and farmers' meetings were attended, and addresses given, including Western Canada Dairymen's Convention at Calgary; Alberta Cattle and Swine Breeders' Associations, and the Western Canada Society of Animal Production. Within the last year seven lectures on various live stock subjects were given over the radio, and four press articles of considerable length were prepared for farm papers in western Canada and Scientific Agriculture.

Bulletins.

One bulletin, "Some Problems in Bacon Hog Production," was prepared and issued in October, 1927. This publication deals with the results of three years' work that was outlined with a view to securing definite data on the effect of different methods of feeding, protein supplements, pasture and exercise on the type of hog and quality of carcass produced.

Market Cattle Exhibit.

Contributions of calves from various breeders in the province during 1926 made it possible to again send a creditable exhibit of fat steers to the Royal Agricultural Winter Fair at Toronto, and the International Live Stock Exposition at Chicago in 1927. Eighteen animals were included in last year's exhibit, among which were several steers bred at the University. The three beef breeds were represented as follows: Eight pure-bred Shorthorn, five pure-bred Aberdeen-Angus, four pure-bred Herefords, and one grade Shorthorn.

A complete statement covering the different animals, together with their winnings, is presented, which goes to show that the year 1927 has been the most successful since the enterprise was started eight years ago. There is no question that the idea of advertising Alberta as a breeding and feeding ground for good cattle, which is the primary object of this exhibit, is having its effect. As was the case in previous years, a great deal of interest centred around the display of steers from Alberta, and the fact is being recognized more and more each year that this province has much to offer to the man interested in good live stock.

The Live Stock Branch of the Federal Government co-operating with the Alberta Provincial Department of Agriculture, very generously paid the freight on the exhibit from the University again last year. This contribution helps, in a very material way, and is much appreciated. Credit for much of the success that has been achieved in connection with the exhibit must also be given to the breeders of Alberta who have donated calves from year to year.

Winnings of Alberta Steers, Shown by University of Alberta, at Toronto and Chicago, 1927.

ROYAL AGRICULTURAL WINTER FAIR, TORONTO

Name of Animal.	Breeder.	Breed and Class.	Award.
Choice U.A.	U. of A., Edmonton	Shorthorn, Junior Yearling	Fourth
Scona Lord	U. of A., Edmonton	Shorthorn, Junior Yearling	Second
Lancaster Fortis	W. W. Sharpe, Stettler	Shorthorn, Junior Yearling	Third
Keystone	U. of A., Edmonton	Shorthorn, Junior Yearling	Fourth
Cornerstone U.A.	U. of A., Edmonton	Shorthorn, Junior Yearling	Fifth
Gallant King	G. M. Thomson, Youngstown	Shorthorn, Junior Yearling	Sixth
Lovely Dale	U. of A., Edmonton	Shorthorn, Senior Calf	Seventh
Prince Clive	J. L. Walters, Clive	Shorthorn, Junior Calf	Fourth
Pride's Lad	C. H. Richardson, Bowden	Aberdeen-Angus, Senior Yearling	First
Idlewyld Alberta	A. M. Thomson, Vegreville	Aberdeen-Angus, Junior Yearling	Second
Baron U.A.	U. of A. Edmonton	Aberdeen-Angus, Senior Calf	Third
Panama Donald U.A.	U. of A., Edmonton	Hereford, Junior Yearling	First
Rock Creek Chief	J. A. McEachern Co., Burmis	Hereford—Junior Yearling	Third
Bonnie Lord	Mrs. H. G. Sherry, Clover Bar	Herefort, Junior Yearling	Fifth
Baronet	U. of A., Edmonton	Hereford, Senior Calf	Second
Admiral	U. of A., Edmonton	Grade, Junior Yearling	First

WINNINGS OF ALBERTA STEERS AT TORONTO, 1927

Group of three steers, 1000-1200 pounds—Idlewyld Alberta, Evocate Stamp, Admiral .... First

Group of three steers, 1000-1200 pounds—Panama Donald U.A., Bonnie Lord, Barnet .... Fourth

Group of three steers over 1200 pounds—Lancaster Fortis, Choice U.A., Scona Lord .... First

Group of three steers over 1200 pounds—Rock Creek Chief, Keystone, Pride's Gift .... Second

Champion Aberdeen-Angus steer: Pride's Lad.
Champion Shorthorn steer: Choice U.A.
Champion Hereford steer: Panama Donald U.A.
Champion Grade of Cross-bred steer: Admiral.
Grand Champion steer: Choice U.A.
Champion group of three steers on: Lancaster Fortis, Choice U.A., Scona Lord.

SUMMARY: Grand Champion, Five Championships, Six Firsts, Four Seconds, Three Thirds, Three Fourths, Two Fifths, One Sixth, One Seventh.

Of the eighteen steers showing, every anmial was in the money.

INTERNATIONAL LIVE STOCK EXPOSITION, CHICAGO, 1927

Name of Animal. Breeder. Breed and Class. Award.
Choice U.A.—U. of A., Edmonton—Shorthorn, Junior Yearling..........First
Scona Lord—U. of A., Edmonton—Shorthorn, Junior Yearling..........Fifth
Lancaster Fortis—W. W. Sharpe, Stettler—Shorthorn, Junior Yearling........Seventh
Keystone—U. of A., Edmonton—Shorthorn, Summer Yearling..........Seventh
Prince Clive—J. L. Walters, Clive—Shorthorn, Junior Calf..........First
Three Shorthorn Steers: Lancaster Fortis, Choice U.A., Scona Lord..........Second
Champion Shorthorn Steer: Choice U.A.
Rock Creek Chief—J. A. McEachern Co., Burmis—Hereford, Junior Yearling..........Third
Panama Donald U.A.—U. of A. Edmonton—Hereford, Summer Yearling........Fifth
Baronet—U. of A., Edmonton—Hereford, Senior Calf..........Fifth
Three Hereford Steers: Rock Creek Chief, Panama Donald U.A., Baronet....Fourth
Evocate Stamp—Dickson & Hunter, Innisfree—Aberdeen-Angus, Junior Yearling..........Thirteenth
Idlewyld Alberta—A. M. Thompson, Vegreville—Aberdeen-Angus, Summer Yearling..........Fourth
Admiral—U. of A., Edmonton—Grade, Summer Yearling..........First
Three steers, any breed, pure-bred, grade or cross, get of one sire..........Third
John Clay and Co., Special—Choice U.A., Second; Panama Donald U.A., Fifth; Group of five steers, Third.

SUMMARY:One Championship, Three Firsts, One Second, Three Thirds, Two Fourths, Five Fifths, Two Sevenths.

Of twelve animals showing all, excepting one, was in the money.

University Studs, Herds and Flocks.

Horses.

No addition in the way of purchases has been made to the horse division during the past twelve months. Three foals—two Percherons and one Belgian—were raised in 1927. At the present time there are twenty-three horses on hand, made up as follows: Eleven pure-bred Percherons, six mares and five geldings; six pure-bred Clydesdales, five mares and one gelding; and four pure-bred Belgians, three mares and one gelding. In addition there is one saddle horse and one driving horse.

Beef Cattle.

Satisfactory progress has been made in the development and improvement of the beef herd during the last year. Practically all the females in the herd of breeding age have dropped calves within the past twelve months, and a fairly large percentage of these have been heifers, this being particularly true in the case of both the Aberdeen-Angus and Hereford herds. The Shorthorn bull, Browndale Consul, that was purchased in 1926 has developed satisfactorily, and judging from the few calves sired by him that have arrived recently, he should be an asset to the Shorthorn herd.

A Shorthorn cow, U.A. Roan Lady 101st, has just completed a 365-day record of 15,428 pounds of milk and 644 pounds of butter-fat. In addition to making this highly creditable record, this cow is also the dam of the steer, Choice U.A., which was grand champion steer at the 1927 Royal Agricultural Winter Fair, Toronto, and Champion Shorthorn steer at the 1927 Chicago International Live Stock Exposition.

The beef herd at the present time is made up of thirty-four Shorthorns, fourteen Aberdeen-Angus and fifteen Herefords. These are all pure-bred females. Practically all the male calves in the beef herd have been used in connection with the herd of show steers that is exhibited each year. Keeping in mind that the ultimate end of all beef animals is the butcher's block, possibly there is no better way of determining the real value of beef herds than the showing their progeny is able to make in the market classes at the larger shows. The financial returns in selling these animals as steers rather than as breeding bulls has also justified this policy during the past few years. Another feature that might be mentioned in favor of this plan is that the University is not competing with other breeders of pure-bred stock in the province in the sale of their surplus breeding animals. During the past twelve months there has developed a better demand for good beef sires, and it is felt that the time has come when at least some of the best bulls might be retained for breeding.

Twenty head of pure-bred steers are not in the herd. These range in age from calves a few weeks old to animals up to eighteen months. A number of these have been contributed by different breeders in the province. A herd of from twelve to sixteen nurse cows is maintained to take care of the steers being fitted for showing.

Dairy Herd.

The dairy herd is made up of thirty-eight Holstein-Friesians and thirteen Jerseys. Of these, twenty-eight are cows in milk, eighteen heifers not in milk, two herd bulls, and three bull calves.

In October a Holstein-Friesian bull from Cloverdale Farm of British Columbia was added to the herd. The sire of the bull was bred by the Colony Farm, is a double grandson of Sir Ormsby Maid Champion, a bull with many high-producing daughters, and is a grandson of Zarilda Clothilde 3rd DeKol, with a 33,153 pound milk and 1,194.5 pound butter record. On the dam's side the bull traces to many high two-year-old records. At the recent Toronto Royal Winter Fair he stood third, being only beaten by two aged bulls that have been champions many times in the bigger Canadian shows.

Two promising yearling Jersey heifers were purchased to strengthen the Jersey herd. Both heifers were bred in the United

States, and are both grand-daughters of the famous Jersey bull, "The Cid."

Nine R.O.P. records were completed during the past twelve months by eight cows, the most noteworthy of these being made by a two-year-old Jersey heifer, Alberta U. Silk Gown 2nd, of 529 pounds of butter-fat from 9,852 pounds of milk. Since she was in calf for two hundred days while on test and made a record sufficiently above the requirements of the Registry, she qualified for the Silver Medal Certificate, issued by the Canadian Jersey Cattle Club. The remaining records were as follows:

305-DAY CLASS.			
HOLSTEINS:	Age.	Milk.	Butter-fat.
U.A. Pontiac DeKol	5 years	11,199	490
Llenroc Posch Lady Teake	3 years	11,409	427
Rosebud Pontiac DeKol	8 years	15,384	534
JERSEYS:			
U.A. Silk Gown 5th	6 years	8,609	443
365-DAY CLASS.			
HOLSTEINS:			
Rosebud Mutual DeKol	11 years	14,941	504
U.A. Pontiac DeKol	5 years	12,360	469
Hulda Pontiac Lass	7 years	15,201	595
Jemima Aaggie Francy	6 years	13,223	502

Eight pure-bred bull calves were sold to breeders within the province. Five of these were Holsteins and three Jerseys. Included in these were a son of Llenroc Fayne Beatrice, that produced 18,937 pounds of milk and 622 pounds fat in 305 days, two calves from the high-producing Jersey heifer as mentioned above, and also one bull calf from a Jersey with a 640 pound butter-fat record.

Swine.

Approximately fifty brood sows have been carried over the winter of 1927-28. The object is to have a sufficient number of pigs available for summer feeding experiments in 1927 and also a number of pure-bred boars and gilts for distribution and seed stock to farmers throughout the province. On the average 350 spring pigs and 125 fall pigs are farrowed annually.

At the present time the Yorkshire and Tamworth breeds predominate. The representation of Berkshires and Duroc-Jerseys has been materially reduced during the past year. The policy at the present time is to maintain the Yorkshire and Tamworths as pure-breds, crossing boars of these breeds on a number of Berkshire, Duroc-Jersey and Poland China sows which are being kept for class-room and demonstration purposes. During the past summer a small herd of Tamworths was shown at the Calgary and Edmonton exhibitions. In the face of very strong competition they made a creditable showing. At Calgary the winnings included second prize on aged boar, second and third prizes on aged sows, and a number of prizes on younger stock. At Edmonton the aged boar and sows were given the same rating; first prize was secured on sow and litter and on aged herd.

A fair demand has existed during the year for boars, and a goodly number have been distributed throughout the province. Young sows have also been generously distributed, although the interest in this class of stock has not been as keen as in 1926, due to the depressed condition of the hog market at the present time.

Sheep Flock.

One hundred and forty-five pure-bred and eighty-six grade sheep were included in the breeding flock in March, 1928. In the pure-breds, sixty-three are Hampshires, twenty-nine Suffolks, twenty Shropshires, twenty Oxfords, and eight Leicesters. During the year the number of pure-breds has been increased by fifteen to meet the growing demand for pure-bred rams and ewes. The grades were reduced by fourteen head.

Thirty-two pure-bred rams and seventeen pure-bred ewes were sold to thirty-two breeders in the province. Twenty-five grade ewes were sold for breeding purposes.

A flock of Hampshires was shown at the Calgary and Edmonton summer fairs, and also at the Toronto Royal Winter Fair. At the latter fair a yearling ewe was first and champion female. In addition, one first, one second, three thirds, and one fourth prize were secured by the seven animals entered.

University Farm.

Negotiations to acquire the subdivision known as Belgravia, lying directly north of the main University Farm, were entered into a year ago. This area comprises approximately seventy-five acres, about half of which is cleared and was cropped in 1927. The location of this land makes it a valuable acquisition, and when it is cleared and fenced can be turned into good use, especially for pasture purposes.

An exceptionally good crop was produced on the University Farm last year. A considerable portion of the farm as required for pasture and another smaller area is devoted to experimental pastures and paddocks. In addition to providing for pasture and test plots, approximately six hundred and fifty tons of silage, four hundred tons of green feed, and over two thousand bushels of oats were produced last season. At no time since the farm was operated by the University has there been such a large volume of home-grown feed on hand as there is this year.

DEPARTMENT OF VETERINARY SCIENCE.

For a number of years Veterinary Science has been given an important place on the curriculum of the Agricultural College in the United States and Canada. In this day of specialization in certain phases of Agriculture, Veterinary Science would appear to fit in particularly well with the course given in Animal Husbandry.

In order to give students information which will enable them to carry on their work in a satisfactory manner, considerable thought has to be given by the instructor to the selection and preparation of material for the lectures. It is our opinion that graduates of Agricultural Colleges who have directed their thoughts and energies along the lines of Animal Husbandry can be of great service to the community and to the state if they have been taught the dangers of some of the animal diseases. The suppression of some of the communicable diseases by methods of sanitation is a field in which they could well take an important part. In some of the troubles caused by mistakes in feeding, and also in cases of poisoning, they have a wonderful opportunity of giving valuable service to the community in which they live.

The question of disease suppression is one, of course, which will always come under the veterinary surgeon. The immunologist is now controlling disease by the use of preventive biological products never thought possible a few years ago. Our Agricultural graduates —by their training and experience—can do a great deal not only to improve, but to protect the health of live stock.

Our efforts in veterinary education have been directed along the lines of preventable diseases in all classes of live stock, and particularly towards hereditary unsoundnesses in horses. Our graduates —if familiarized with the importance of this end of the work—can assist in a great measure in the improvement of the horse industry in Alberta.

DEPARTMENT OF DAIRYING.

Regular Courses.

The Department of Dairying offers three courses in the degree work at the University. The general home dairy course is taken by all students who register for degree work in the Faculty of Agriculture, and who have not attended any of the Provincial Schools of Agriculture. Two elective courses are also open to regular students, covering certain fields of factory dairying.

Special Courses.

In addition to the regular courses of instruction already referred to, special creamery courses of three to four weeks' duration are given each year, in co-operation with the Provincial Department of Agriculture. These special courses are planned more particularly for the benefit of people who have had some practical experience in creamery operations, and who may wish to spend a short time in a systematic study of the more important principles upon which the practical work is based. This year there was a total registration of sixty-six in the special courses, and students registered from different points in Alberta.

The following quotation from the announcement of the course which commenced January 4, 1927, gives in outline the general character and scope of the special courses:

"Lectures and Reveiw will be given each day during the course, dealing with principles and methods in the production and handling of milk and cream; the testing, grading and quality basis of marketing of milk, cream and butter; the care and handling of the apparatus and equipment used in creamery operations and aspects of the development and organization of the dairy industry.

"The Practical Work in the laboratories will include the receiving, recording, testing, grading and pasteurization of milk and cream; buttermaking; grading and testing of butter, and the handling of centrifugal cream separtaors.

"It is the purpose of the course to bring out the importance of closely studying and checking the details of the various operations in the course of the day's work, and the daily programme will be so arranged that creamery workers, who are not in a position to take the full course, may be able to plan a shorter stay and still participate in the lines of work that interest them most."

During the year ending March 31st, three Short Courses were held in this Department, as follows:

May, 1927, with 16 students (Provincial Cream Grader)
January, 1928, with 13 students
March, 1928, with 10 students
—
39 students

It will be noted that the attendance at these courses was somewhat smaller than the attendance at similar courses held during the previous year. This was undoubtedly due to the very considerable temporary reduction in the volume of cream supplied to the creameries of the province and the consequent shorter seasonal term of employment and reduced earnings of many of the creamery workers, who would ordinarily have attended a short course during the winter.

As in former years, the Provincial Department of Agriculture furnished us the necessary expert assistance to carry out the work of the Department of Dairying. Acknowledgment is also due to Mr. W. J. Beckett, Senior Federal Dairy Produce Grader at Edmonton, for valuable assistance rendered in connection with the instruction work in the special courses.

During the summer and fall of 1926 samples of normal and surface taint butter were studied to determine differences in chemical and biological composition. It was believed that such information should be of value in determining the factor or factors responsible for this defect, which is causing considerable loss to the creamery men of western Canada.

The titrable acidity of S.T. samples usually gave a low value (water soluble acidity), although occasional samples showed an acidity much higher than that of the normal samples studied.

Because the titrable acidity is increased where boric acid is added as preservative at the creamery, and because the degree of acidity-hydrogen ion concentration is the more important factor re biological or chemical change, it was decided to make a fairly exhaustive study of this angle of the problem.

The pH (hydrogen ion concentration) of butter being a virgin field for investigation, many different methods were tried out, including the Gillespie, Spot, and La Motte colorimetric methods, and the electrometric method, using both open and closed electrodes. For general work, the La Motte method was found most suitable, although the outfit for this did not arrive until November, after the majority of the work had been done. Results obtained comparing normal and S.T. butters showed that the latter tended to fall within a narrow range slightly on the acid side of neutrality, while the normal samples showed a wider range, with a tendency toward greater acidity. Nevertheless, the majority of the normal samples examined showed a pH within the range of the S.T. samples, suggesting that the acidity alone will not explain the occurrence of this defect. A fairly high degree of acidity may be an important inhibitory factor, as is shown by numerous experiments in which churnings of S.T. butter, when reworked with acid, have failed to show any further evidence of development of the taint.

Concurrently with the acidity studies, the bacterial, mould and yeast content of samples was determined. The bacteria were further divided into acidifiers, casein digesters, and others. Although the average count in all classes was higher for the S.T. than for the normal samples, yet occasional samples of normal butter were found giving very high counts. This would indicate the desirability of studying the individual types of organisms occurring in the S.T. samples, and determining from what source they enter the butter.

Composition tests on 18 consecutive churnings, 9 of which developed S.T., showed that the average brine concentration of the normal samples was 13.35%, while that of the S.T. samples was 9.7%. Low salting may therefore assist the development of S.T.

Tests to determine the relative activity of proteolytic enxymes showed considerably higher activity from S.T. samples.

Inoculation of portions of normal butter with sterilized and unsterilized serum from S.T. butter resulted in the development of S.T. in 75% of the lots inoculated with unsterilized serum, while none developed from sterilized serum.

A typical S.T. was produced in an experimental churning on December 22, where the acidity had been reduced to 0.125%. Unfortunately, this particular churning showed heavy contamination with moulds, yeasts and digesting bacteria.

Results to date point to the desirability of a study of the organisms encountered in S.T. butter, and a search for their sources. Carefully planned experiments, where churnings of cream of varying degrees of acidity were inoculated with these organisms in various combinations, and with varying salt contents in the finished lots of butter, should throw considerable light on the cause or causes of this puzzling defect.

DEPARTMENT OF FIELD CROPS.

I.—Seed Distribution.

The Department of Field Crops has for some years co-operated with the seed-growers of Alberta by maintaining so far as possible pure stocks of the leading registered crop varieties in the province. Growers may from time to time purchase from the Department at reasonable cost small quantities of elite stock seed with which to renew their main crop.

The Department also maintains limited stocks of certain non-registered varieties, mainly of its own breeding or selection, which are believed to fill a useful place in some part of the province.

There are thus two distinct classes of seed distributed and two purposes served: (1) Elite stock seed, promoting the work of the Seed Growers' Association, both provincial and national; (2) non-registered seed of varieties or selections which in tests at the University have surpassed in yield or quality or adaptation the kinds commonly grown, and of which growers may be desirous of securing reliable stock for testing on their farms.

About 400 applications for seed were received between December 1, 1926, and March 31, 1927. These represented a demand, in most cases, in excess of the quantity available. Nevertheless, the Department's policy of limiting individuals to a few bushels of grain, or a few pounds of the small seeds, made quite a widespread distribution possible. The following quantities were sent out:

ELITE STOCK:		
Renfrew wheat	68	bush.
Banner oats	101	"
Victory oats	36	"
O.A.C. 21 barley	42	"
Dakold winter rye	3	"
Golden vine peas	5	"
Arctic sweet clover	82	lbs.
NEW VARIETIES:		
Red Bobs No. 222 wheat	72	bush.
Altaswede red clover	115	lbs.
Fyra western rye grass	67	"
Swallow timothy	44	"

A great many enquiries were received for elite Marquis wheat. These could not be filled, as our new pure lines of this variety will not be available in sufficient quantity for distribution until the spring of 1929. The unavoidable delay is greatly regretted, as Marquis wheat is still the plant breeders' standard of quality, and the mainstay of the high reputation of Canadian wheat on the world's markets. Though rust has made it impracticable to grow Marquis in some parts of Manitoba, and frost has prevented its proper maturity in parts of all three prairie provinces, it is nevertheless to be deplored that many farmers have been stampeded into abandoning Marquis for inferior new varieties without sufficient cause.

During the ten years that wheat breeding has been carried on at the University, one new variety and one selection of an old variety have been distributed, namely, Renfrew and Red Bobs No. 222. These were distributed to meet the needs of particular districts, but not for any general displacement of Marquis. Comparative yields and other experimental data are given later in this report, together with the results of other wheat variety tests. On account, however, of the great public interest in new wheat varieties, a fuller statement in regard to these two will be given here.

Renfrew Wheat.

At the last general meeting of the Canadian Seed Growers' Association, Renfrew wheat was officially accepted for registration. This variety, following several years' test at Edmonton, was for three years just prior to registration subjected to a further test in comparison with Marquis at all experimental stations in Alberta, with the following results: (1) Renfrew averaged over five bushels per acre more than Marquis, and in 22 of the 30 comparisons Renfrew yielded from one to twenty-one bushels more, while in the other eight cases Marquis yielded from one-half to six bushels more; (2) in length and strength of straw Renfrew was found to be superior to Marquis, an advantage in certain districts; (3) Renfrew had practically the same high milling and baking quality as Marquis; (4) the average growing period at all Alberta stations except Edmonton showed Renfrew to be two days later, while at Edmonton it matured five days later than Marquis.

These results led to the conclusion that Renfrew was well adapted to the southern and eastern parts of the province. In these areas, where rainfall is limited, length of straw is important, and danger from early fall frosts small, this variety has met with marked success.

The rust reactions of Renfrew and Marquis are similar, both being non-resistant. Rust is not usually a serious problem in Alberta, although this year there was more than usual on account of the late season. Late-maturing varieties of wheat would be expected to suffer more injury through being attacked at a less advanced stage of development. Similarly, any soil condition, such as summerfallow, which delays maturity of the crop, would leave it more open to rust injury. Although no evidence of shrinkage in the grain could be observed in rusted specimens of Renfrew sent in to the University, a few reports of such shrinkage were received from the eastern part of the province, where rust was worst. In any event, Renfrew is not recommended for rust districts.

Red Bobs No. 222.

Red Bobs No. 222 is a selection from Red Bobs, and resembles the parent variety in most particulars, though somewhat higher yielding. It also closely resembles Early Triumph, a selection from Red Bobs made by Dr. Seager Wheeler.

Red Bobs No. 222 usually outyields Marquis, but is somewhat inferior to the latter in baking quality; consequently it should not be used to replace Marquis where the latter ripens satisfactorily. Red Bobs and its various selections are also slightly more susceptible to rust and other diseases than is Marquis, so cannot be depended upon to escape attacks by reason of their earliness.

Our own selection, No. 222, was distributed in the spring of 1925, in response to urgent requests from certain northern districts for a wheat earlier than Marquis and more productive than Ruby. This need it has met very satisfactorily in so far as yield and earliness are concerned, and its quality is at least reasonably good.

At the time of the original distribution, it was announced that the available stock was not perfectly pure. Selection work has been continued, but our present stock still shows an occasional plant with short beards at the tip of the head.

Improvements in Seed Handling Facilities.

A Carter disc machine has recently been added to the Department's equipment for the mechanical cleaning and grading of seed. The entire seed-cleaning plant in the Field Crops barn is also being remodelled to increase its capacity and efficiency.

This year the Press Bulletin announcing our annual seed distribution was enlarged to include descriptive notes on all the varieties of which seed is available, as well as a summary of some of the more interesting results obtained in our experimental fields. In addition to the regular mailing list for this publication, it was sent to about 900 growers of registered seed in Alberta. It was hoped in this way to give complete and satisfactory information to interested growers, while at the same time reducing the burden of correspondence connected with seed distribution.

Other Extension Activities.

While the distribution of pure foundation stock seed constitutes perhaps our most important service to the farmers of the province, it does not constitute the whole of our extension activities. During the past year the departmental staff answered nearly 600 letters from farmers inquiring for technical advice, and gave over 20 public addresses by radio or at seed fairs and other meetings. The Department also received individually something like 200 farmer visitors, in addition to a number of convention or excursion groups.

II.—Cereal Crop Investigations.

Wheat Variety Tests.

In the table below are given some of the data collected in wheat variety tests during the past 8 years. It will be observed that for the first five varieties on the list 8-year averages (1920-27 inclusive) are given, while for the next three varieties only 2-year average are available. The last two varieties, Reward and Vermilion, were included in the variety plots for the first time in 1927. Vermilion had been tested in rod-rows in 1923 and again in 1926, but proved very weak-strawed and late. However, on account of the interest which this variety had aroused in the eastern section of the province, it was transferred to the larger plots in 1927. The growth period cannot be shown in the table, as it failed entirely to ripen. It was very difficult to harvest on account of the lodging of the straw.

RESULTS OF WHEAT VARIETY TESTS AT EDMONTON, 1920-27.

Variety	Growth Period		Height of Plants		Yield of grain per acre	
	1927	8-year aver.	1927	8-year aver.	1927	8-year aver.
	Days		Inches		Bushels	
Marquis	115	113	47.1	41.0	63.4	44.3
Renfrew	118	118	51.7	46.3	54.3	48.7
Red Bobs No. 222	107	109	43.0	40.1	49.8	49.4
Red Fife	119	118	52.5	44.4	51.2	44.6
Kitchener	118	116	51.7	43.3	56.4	47.7
		2-year aver.		2-year aver.		2-year aver.
Garnet	106	106	45.7	44.9	51.9	48.4
Supreme	111	113	42.5	45.0	56.5	48.2
Early Triumph	108	108	44.5	44.8	62.1	45.1
Reward	109	....	42.0	....	46.9	....
Vermilion	....	....	54.5	....	51.2	....

Rod Row Tests.

In the 1927 rod-row tests, 50 varieties and strains of wheat and 56 of barley were grown in quadruplicate. The barley test was spoiled to some extent by excessive lodging, which resulted from the high winds and heavy rains of early July. The results will therefore be omitted here. The wheat test was but slightly interfered with, and the following yields were obtained from named varieties:

Marquis	52.1 bush. per acre
Garnet	53.4 " " "
Reward	60.0 " " "
Ruby	52.1 " " "
Early Triumph	62.9 " " "
Supreme	65.0 " " "
Producer	52.5 " " "
Huron	66.7 " " "
Axminster	66.7 " " "
Vermilion	46.7 " " "

Pure Line Studies.

This year the lines of Renfrew and Red Bobs No. 222 from the 1926 rod-rows were grown in small plots for the purpose of study of uniformity. In all, there were thirty-eight lines of Renfrew, and forty-three of Red Bobs No. 222. In addition to these, similar work was carried on with twenty-four lines of Marquis.

During the winter the plants from each of the above rows were examined for varietal purity and vigour. All lines showing weaknesses in either respect were discarded, the remainder being reserved for multiplication. Reserve samples of the accepted lines were stored for future use.

In addition, head selections were made from the best lines in order to provide for 100 head rows each of Marquis, Renfrew and Red Bobs No. 222 in 1928. Head selections of Banner and Victory oats and Alberta Beardless barley, which were made in the field in the fall of 1927, were also re-examined, 100 of each being chosen for propagation in 1928. It is hoped that by careful selection, coupled with artificial self-fertilization, improved lines of each of these varieties of wheat, oats and barley will be obtained.

Small plots of six re-selected lots of Marquis and two of Red Fife were also grown, and the most uniform strain of each was chosen. These will be used for immediate multiplication as elite seed.

Co-operative Experiments.

Three co-operative experiments with cereals were carried in 1927. The first of these was a study to determine the date of appearance of rust, the prevalence of the various strains of rust, and the relative resistance of wheat and oat varieties to this disease. Twenty-four wheat and eighteen oat varieties, received from the Dominion Rust Research Laboratory, Winnipeg, were grown for this study.

In co-operation with the Dominion Seed Branch, a study of lots of seed taken from farmers' drills was carried out. There were twenty-five lots of oats and forty-eight of wheat. The resulting crop is being analyzed as to purity of variety, and a report will shortly be sent to the Seed Branch.

A test of the comparative winter hardiness of thirty varieties of winter wheat was carried out in co-operation with the U.S.D.A. This test has been under way since 1920, and was laid down again this fall. Though it is primarily a study of winter survival, we have kept yield records beginning with the seeding of 1921, and present a summary here for those varieties which have been in the experiment from the outset. Kharkof No. 22, the last variety on the list, has been under test only four years, but is added because it has met with most favour in Alberta.

AVERAGE SURVIVAL IN PER CENT. AND YIELD IN BUSHELS OF WINTER WHEAT AT EDMONTON, 1920-1927.

Variety	Survival		Yield per acre	
	1927	Av. 1920-27	1927	Av. 1920-27
Kharkof	33%	49%	42	26
Montana No. 36	49	52	52	28
Nebraska No. 60	35	55	50	27
Beloglina	55	57	72	38
Blackhull	43	43	31	19
Padui	70	63	74	27
Minturki	57	59	49	27
Kanred	35*	56	75*	37
Buffum No. 17	95	67	62	29
Minhardi	87	64	43	28
Odessa	95	68	62	31
Turkey (Sel. C.I. 6152)	52	57	46	33
		Av. 1923-27		Av. 1920-27
Kharkof No. 22	58	78	43	44

*The yield of Kanred in 1927 is out of proportion to its survival this season. It was planted between two of the lowest yielders, and thus had an unfair advantage.

The history of this test gives an indication of the risks attending winter wheat production in the Edmonton district. No variety has succeeded in coming through any of the past seven winters without damage. In two of these seasons (1921-22 and 1922-23) every variety was completely winter-killed. On account of these occasional heavy losses, the average yields do not compare favourably with those of spring wheat at Edmonton. It is probable that in the southern part of the province the relative position of the winter wheats would be improved.

In regard to Kharkof No. 22, it should be noted that this variety missed the two worst winters which pulled down the averages of the other varieties.

Cereal Breeding.

The cereal breeding projects under way have as an object the following productions: (1) a smooth-awned barley which is satisfactory in other respects; (2) a superior, early-ripening variety of wheat; (3) an oat variety which does not throw false wild forms; (4) wheat and barley varieties which are resistant to root-rots. The first crosses in connection with projects (2) and (3) were made during the past season.

A Study of "Critical Periods" in the Growth of Cereal Varieties.

During the past seasons a beginning was made in the collection of systematic measurements of growth rates, and of dates of emergence, heading, flowering and maturity, in all named varieties of cereals grown at this station. As weather records are also available, it would be possible later to study the progressive development of the plants in relation to the seasonal march of weather conditions. This should show us more clearly how to develop varieties which fit better into our average climatic conditions.

III.—Forage Crop Investigations.

Morphological Variations in Alfalfa.

One of the greatest difficulties in the inspection and registration of alfalfa is the great variation found within varieties and the consequent lack of clear-cut distinctions between varieties and strains. The study of a number of strains, begun in 1925, has been continued. On account of the magnitude of the problem, it was decided this year to confine observations to the leaf and the inflorescence. From each of the more important strains fifty or more plants were taken at random, and from each of these plants a fully developed leaf and a normal inflorescence at the tripping stage were taken, pressed and mounted on cards for laboratory study. Detailed measurement studies of these leaves and inflorescences will be made during the winter. It is hoped that the study may make it possible to define more precisely varietal types and their normal range of variation.

In an attempt to secure more uniform strains, artificial self-pollination of selected plants is being practised. Seed from about 100 plants selfed during the past season will be planted next spring.

Seed-Setting Problems in Alfalfa.

As a necessary preparation for the investigation of abnormal conditions which may be responsible for the failure of seed to set, a study is being made of the normal development of the flower. As an additional line of attack on this problem, about a dozen plants which gave a heavy crop of seed in 1927 were harvested and threshed individually. The seed will be used to propagate new strains, which will be tested for seed-yielding capacity.

Morphological Variations in Agropyron Species.

A graduate student during the past summer collected a large number of forms of these species (one of which is the common Western Rye grass) in the vicinity of Edmonton and from a group of strains grown at the Experimental Farm, Scott, Sask. The mode of pollination in five species was investigated. These results, as well as those obtained in a morphological study completed during the winter, are reported fully in the M.Sc. thesis of Mr. Wilfred Robinson, entitled "Studies on the Genus Agropyron." This preliminary study promises a basis for plant-breeding work with these important grasses.

Timothy Breeding and Variety Testing.

A plant of Swallow timothy, selected as the best out of 2,500 belonging to various strains tested in 1920 and 1921, was multiplied separately, first vegetatively and later by seed from an isolated plot. A considerable block of individual plants of this strain is now being made the basis of further mass selection. About 50 superior plants were marked this year, and next year all the others will be cut before flowering, and seed taken only from the chosen ones. This seed will be propagated, and the process repeated as a means of maintaining a gradually improving stock.

As a more rapid method of getting uniform strains, 20 good plants were artificially self-pollinated, and the first inbred generation will be propagated next season.

The next step in timothy improvement is the testing of new strains for comparative agricultural value. So far this has been limited to a comparison of the original Swallow stock and Boon. The latter is a production of the Dominion Experimental Farms. This season Swallow, as in previous tests, gave a higher yield of hay. On the other hand, the first comparative test for seed production, which was made this year, indicated Boon to be superior in this respect.

Red Clover Breeding.

The three selections of Altaswede, which have been carried on in isolated plots for some years, were allowed to produce seed again in 1927. In two of the strains there had been considerable killing last winter. Presumably the seed obtained this year is from the hardiest plants, and it will be used to set out new stands for further mass selection.

Corn Variety Tests.

Six varieties, in addition to four selections of white flint from H. Trelle, were compared with Howes' Alberta Flint. None of the varieties or selections were quite as early as Howes' Alberta Flint, though Trelle's strains were nearly as early. Some selections from Erskine were also quite early. North Dakota Flint yielded about 17.6 tons green weight per acre, but yielded no matured ears. Howes'

Alberta Flint yielded about 8.2 tons of green weight per acre and about 1,318 lbs. of hard cured ears per acre. Trelle's strains averaged about 7.7 tons of green weight per acre and about 1,230 lbs. of hard cured ears per acre.

Grass and Legume Garden.

About thirty species, varieties and strains of alfalfa, sweet clover and grasses were grown, seven of which were new introductions. These were Teff grass, *Agrapyron pungens*, a strain of yellow sweet clover, and four lawn grasses. The Teff grass made a good growth (16in.-20in. high), and appeared to be a good pasture and a fair hay grass. It lodged somewhat, however. All the lawn grasses made good growth and appeared to be very promising for lawn making purposes. Creeping Bent and Seaside Bent gave the most vigorous stoloniferous growth.

Method of Seeding Alfalfa for Hay Production.

The plots used for this experiment were seeded in 1926, and this year's cuttings were, therefore, the first hay crop. On account of the backward season the cuttings were made July 12 and September 27, this being about 2 or 3 weeks later than usual. In the following table the average yields from triplicate plots with various spacings between rows are reported on the basis of 15 per cent. moisture in the cured hay.

	Average hay yields in tons per acre.		
Spacings between rows.	1st cutting.	2nd cutting.	Total.
9 inches	2.09	1.62	3.71
12 inches	2.08	1.44	3.52
18 inches	1.85	1.47	3.32
24 inches	1.87	1.38	3.25
30 inches	1.77	1.28	3.05

It will be noticed that the yields fall off gradually with increasing width of spacing. The results of an earlier experiment of the same sort suggests, however, that in a season of less ample rainfall the relationship would probably be changed. In the former experiment, the best yields of both hay and seed were obtained from the 24-inch spacing.

Method of Seeding Timothy and Western Rye Grain for Seed Production.

The experiment of which the first three years' results were reported last year in our timothy bulletin (Research Bull. No. 3) was completed in 1927. This year's results confirm the conclusion that in seasons of ample rainfall such as the present, higher yields of timothy seed are obtained from the narrowly spaced rows. The opposite result was previously found in dry seasons. However, with western rye, a much more drought-resistant grass, better results were obtained from narrow spacings in all seasons.

Time of Plowing Brome Grass Sod.

A second experiment was laid down in 1924 to test the conclusion reached as a result of an earlier experiment, namely, that early plowing was very important in the control of brome grass. This second experiment was completed in 1927, and largely confirmed the earlier results. The following table shows the average yield of wheat from triplicate plots, and the average number of volunteer brome plants in the wheat stubble, for various dates of plowing.

Time of plowing.	Yield of wheat 1927, bush. per acre	Volunteer brome plants, av. No. per sq. yd.
July 16, 1926	36.2	1.7
Aug. 16, 1926	36.2	3.0
Sept. 20, 1926	37.5	4.7
Oct. 15, 1926	30.8	9.7
April 25, 1927	29.4	17.3

The pronounced decline in yield with later fall plowing, found in the earlier experiment, did not occur this time, possibly because the abundant rainfall of 1926-27 supplied sufficient moisture both for the decomposition of the sod and the growth of the wheat crop. For effectiveness in controlling the brome grass, however, the results are again decidedly in favour of early plowing.

IV.—Plant Biochemical Investigations.

The following investigations are now being supported by the National Research Council: Winter hardiness, disease resistance, wheat quality and environment, and the drying of tough and damp wheat. The first three of these have been discussed in earlier reports, and it will merely be stated here that they are progressing satisfactorily.

The Drying of Tough and Damp Wheat.

The wet harvest seasons of 1925 and 1926 came after a long period of years in which the quantity of wheat grain which required artificial drying had been relatively small. Consequently the drying facilities at the terminal elevators were quite inadequate for the large volume of damp grain in these wet years. This, together with the lack of scientific knowledge as to the effect of drying under various conditions, led to a considerable amount of injury both to the grain and to the reputation of Canadian wheat with British millers.

At the beginning of 1927, the Grain Research Committee of the National Research Council undertook to investigate the problem. This body secured the co-operation of the three prairie universities and the Dominion Grain Research Laboratory, Winnipeg. Four main lines of attack were laid down: (1) an investigation by a competent engineer of methods followed in commercial drying plants; (2)

milling, baking and other tests of a large number of samples obtained from commercial drying plants, before and after drying; (3) similar tests of samples of known history, grown at the universities and dried under controlled conditions in an experimental drier constructed at the University of Alberta; (4) similar tests of samples dried under a wide range of conditions in the experimental drier. The last project is meant to determine the limits of safety for temperature, etc.

The first two of these projects were completed during the year, and the others are well under way. It is now known definitely that under suitably regulated conditions wheat can be dried without injury. It should be added that the operators of commercial driers have shown a keen desire to co-operate with the Committee and to modify their methods wherever this may be found necessary.

Effect of Timothy, Western Rye, Brome Grass and Alfalfa on the Yield and Quality of Succeeding Crops.

An important new project along this line was laid down this year in co-operation with the Department of Soils. Previous investigations here and elsewhere have shown that timothy meadows fall off rapidly in productivity, largely on account of a shortage of nitrates. It has been found also that other crops frequently yield less after timothy than after western rye or brome grass. These are our three most important grasses, and a fuller understanding of their effects on soil fertility is very desirable. A good stand was secured this year on 48 plots of these grasses and alfalfa (12 plots each). One cutting of hay was taken, and both soil and plant analyses carried out.

V.—Plant Pathological Investigations.

A new Division of Plant Pathology within the Department of Field Crops came into existence with the arrival of a Plant Pathologist on October 1st. Since that date five projects have been outlined, and preliminary work started on each. As this is an entirely new line of work in Alberta, and these projects are expected to be continued through several years, a rather full explanation is given here.

1. *Investigation of the occurrence, spread and longevity of cereal root-rot in the soil as influenced by (a) environment—soil type, soil reaction, etc.; (b) species of organism.*

EXPLANATION.

Although it is commonly stated that cereal foot and root-rotting pathogenes lives in the soil and accumulate there with successive crops of the same kind of grain, actually very little definite experimental evidence has been advanced in support of this assertion. It is well known that certain of these organisms live over winter on the stubble of the preceding crop, and also on and in the seed. Do they, however, actually live in the soil itself and spread through the soil from one point to another; how long do they persist there; do they live through one or more years of summerfallow; or are they dependent on the crop remains in order to persist? These are some of the questions this project is designed to answer; questions which are of fundamental importance in the cereal root-rot work. There are several organisms concerned in the case of each crop. Most attention will at first be directed on those which attack wheat. Undoubtedly environmental factors, such as soil type, soil reaction, soil moisture, etc., will affect each organism differently. Investigations on these questions will be important as a basis for devising methods of prevention.

PROGRESS AND PROPOSED INVESTIGATIONS.

The wheat in the varietal plots at the University of Alberta was badly affected with foot and root-rot during the past summer. The stubble and soil from several of the most severely affected plots, namely, those occupied by the varieties Red Bobs No. 222, Reward and Supreme, were used as sources of material. Isolations were made from the bases of discoloured culms taken from adjoining drill rows and from the adjacent soil between the drill rows. It would seem reasonable to expect that if the foot and root-rotting fungi grow and spread readily through the soil, one would occasionally be able to isolate the same species from the soil between drill rows as from the adjoining stubble. One species of fungus, namely, *Helminthosporium sativum*, known to cause an important foot and root-rot of wheat and rye, has been consistently isolated from the stubble of the above plots, but cultures from the adjacent soil have consistently failed to yield this fungus. Another destructive root-rotting fungus, namely, *Fusarium graminearum*, has been isolated from the stubble but not from the soil, although other species of the same genus have been found in the soil. So far as the experiments have gone no relation has been found between the species of fungi occurring on the stubble and those in the soil. Many more isolations need to be made, however, before any conclusions can be drawn.

The known root-rotting fungi which have been isolated from the stubble are being used in other experiments.

2. *Chemical treatments of soil and seed for the control of root-rots of cereals (a) liquids; (b) dusts.*

EXPLANATION.

As chemical treatment of soil and seed after a possibility of reducing root-rot damage, it is planned to test out some of the more promising chemicals, and to determine their relative efficiency in reducing the root-rots caused by different species of fungi. Certain chemicals in liquid form, for instance, dilute solutions of sulphuric acid, have been used as sprays for weed control and have also been reported effective in reducing root-rot damage. Rabate, the pioneer in this field in France, has demonstrated conclusively the effectiveness of sulphuric acid for weed control and, as a result, it is now used very extensively by farmers, especially in the wheat-growing sections of France. He also claims that foot and root-rots are much reduced by the treatment, but as the results are somewhat variable, considerably more work need to be done under different conditions. Concentrations as high as 15% can be used without injury to wheat. Aslander points out that weeds are damaged most by sulphuric acid when under relatively dry conditions. Sulphuric acid merits a trial in Alberta for both weed and root-rot control.

Chemical dusts are used to a considerable extent at the present time for seed treatment to control smuts and other diseases of cereals. Some of them reduce seedling blight, which is largely a foot and root-rot of the young plant. New dusts are being devised each year, and it seems quite probable that one may be found which, when applied to the seed or soil, or both, will aid materially in root-rot control. Rather astonishing results have been obtained in the last few years with sulphur dust for rust control, so further work seems advisable in testing promising material dusts for foot and root-rot control.

PROGRESS AND PROPOSED INVESTIGATIONS.

As most of the work on this project will be conducted in the field, little has been done as yet except to obtain materials for work next summer. A hand sprayer and a supply of sulphuric acid has been obtained, and some preliminary tests have been made in the greenhouse for weed control. Oxalis plants which grow luxuriantly under the greenhouse benches, and which harbour a number of troublesome insect pests, have been sprayed with a 2% solution of sulphuric acid, and this has proven effective in killing the plants, but the treatments will no doubt have to be repeated as new plants come up. It is a much quicker and easier way to destroy the plants than by hoeing.

3. *Development of disease resistant varieties of crop plants (in co-operation with Division of Plant Breeding): (a) stripe-resistant barley; (b) root-rot resistant wheat; (c) wilt and rust resistant flax.*

EXPLANATION.

The breeding of disease resistant plants is usually a local or regional problem, largely because of the almost universal occurrence of different physiologic forms of the same plant pathogen in different parts of the country. It will, therefore, no doubt be necessary for us to develop our own disease resistant varieties. The first steps will necessarily be to find strains of our different crops which are resistant to local forms of their plant pathogens and then to combine the resistance of these strains with desired agronomic characters by crossing and selection. Such work will be conducted co-operatively by the Divisions of Plant Breeding and Plant Pathology.

Progress and Proposed Investigations.

One of the most destructive diseases of barley is known as "barley stripe" caused by *Helminthesporium gramineum.* Affected plants develop long brown stripes on the leaves and rarely produce any grain at all. A variety of winter barley known to be very resistant to this disease has been obtained from Belgium. Winter barley cannot be grown successfully in Alberta, so it is planned to make crosses between this variety and O.A.C. No. 21 and Canadian Thorpe, two of our best varieties of spring barley. Sowing of these three varieties have been made in the greenhouse so that crosses can be made during the winter. Barley stripe can be controlled fairly well by seed-treatment, but as the ordinary treatment for smut does not control it, it would be much better to have a resistant variety. The work is being started on the assumption that the resistant parent used is resistant to local forms of the pathogen. This cannot be determined until next summer, but it was thought advisable to start the project in the meantime on the likelihood that a little time spent now may save much time later.

As no varieties are on hand that are known to be resistant to root-rots, it is planned to conduct varietal tests during the coming summer with different organisms to find if possible resistant strains which may be used as parents for breeding work. Different organisms will have to be dealt with separately, as it is very probable that a strain of wheat found resistant to one species of fungus will not be resistant to another. This sub-project will therefore involve considerable preliminary work.

Wherever flax is extensively grown, disease usually becomes a very serious limiting factor in its production. Although flax is a minor crop in Alberta at present, it is not unlikely that it may assume a more important place in years to come, especially in rotations where it is necessary to introduce dissimilar crops in order to reduce the damage from cereal root-rots. In anticipation of this need, and lacking a desirable disease-resistant variety to recommend, it seems advisable to begin work on this project. One or two late maturing varieties of seed flax which are resistant to wilt and immune from rust, and which were obtained from the Minnesota Agricultural Experiment Station, would serve as desirable parents for crosses. In themselves they are of little value for Alberta conditions, but there is little doubt that their disease-resistant qualities can be transferred to more desirable strains by breeding work.

4. *Survey of plant diseases of Alberta.*

EXPLANATION.

In order to ascertain what diseases are most troublesome in Alberta, their distribution in the different parts of the province under varying climatic (seasonal and regional), and soil conditions, a certain amount of survey work will be necessary from year to year. More of this will probably be necessary during the first years of the work.

PROGRESS AND PROPOSED PLANS.

Little opportunity for survey work was affected this fall, as most crops were harvested before work began.

A few observations were made around Edmonton, however. *Ergot* caused by *Claviceps purpurea* was especially prevalent, occurring on a great variety of wild and cultivated grasses. It was even found on timothy, a grass which is rather rarely attacked. It was very abundant on rye, fairly common on wheat and barley, and even occurred on oats.

Rusts.—The following cereal rusts were observed:

Stem rust of wheat caused by *Puccinia graminis tritici.*

Although this rust was rather prevalent on wheat and wild grasses, it apparently arrived too late to cause the severe damage which it occasioned in Manitoba and Saskatchewan.

Stem rust of oats (*Puccinia graminis avenae*).

Stem rust of rye (*Puccinia graminis secalis*).

Leaf rust of wheat (*Puccinia triticina*).

Leaf rust of rye (*Puccinia dispersa*).

Dwarf leaf rust of barley (*Puccinia anomala*) (rare in the N.W.).

Powdery mildew of wheat (*Erysiphe graminis*). This mildew was abundant on winter wheat plots at the University.

Foot and Root-rots (*Helminthosporium sativum*), *Fusarium* spp., etc.—Destructive on wheat varietal plots. Reported severe in different parts of province.

Clover mildew (*Erysiphe polygoni*).—Common.

Corn smut (*Ustilage zeae*).—Conspicuous by its absence.

Leaf spots of barley (*Helminthosporium sativum*) and (*Helminthosporium teres*).—Moderately abundant on volunteer barley.

Smut diseases.—Covered smut of oats (*Ustilago levis*) ; loose smut of oats (*Ustilago avenae*).

It is planned during the coming summer to make a fairly comprehensive survey of crop diseases in different parts of the province over a period of about two months.

5. *Co-operative investigations with Division of Plant Biochemistry on rust resistance.*

Explanation.

At present co-operative experiments are being made to determine the relative toxicity of different phenolic compounds from wheat to an organism (*Helminthosporium sativum*) which attacks wheat, but which, unlike the rust fungus (*Puccinia graminis tritici*) can be grown saprophytically on culture media. It is thought that this may give an indication of which compounds may be toxic to the rust fungus, and some idea of the concentrations in which they are toxic.

Progress and Plans.

The plan is to grow the fungus in flasks on a liquid medium (Knop's nutrient solution), the different flasks containing different concentrations of the phenolic compounds. The dry weights of mycelium developing at the different concentrations are then to be used as measures of relative toxicity. The first experiments are now under way.

DEPARTMENT OF HORTICULTURE.

The work in horticulture is outlined under the following headings: greenhouse, experimental plots, nursery and permanent plantings.

Greenhouse.

In that portion of the greenhouse occupied by the department, a variety of house plants, such as found in the average home and office, are grown for instruction purposes. The students are required to know these plants, so that they can identify them readily, and are given instruction in how to propagate, pot and care for them. The greenhouses, together with the cold frames, are used for starting the annual flowers required for summer bloom in the various flower beds. A third use for the greenhouse is that of instruction in the identification and propagation of the various kinds of bush and tree fruits and ornamental shrubs and trees.

Experimental Plots.

The plots of small fruits have now made their tenth season's growth, and the results clearly demonstrate that there is no reason why they cannot be grown successfully by any one who has a certain amount of shelter or protection for them. During this time the yields have been controlled more by the amount of manuring, cultivation and care than by the weather. Only once in these ten years has a spring frost seriously reduced the crop, and last year was the first time that an insect pest really destroyed a crop—the currant maggot having ruined the crop of currants.

The work with the larger tree fruits has not been at all successful. Nine varieties of hardy standard apples were planted ten years ago, and today not one of them is left. In all cases the trouble seems to be from what is called the black heart, by freezing of the heart wood when the young tree is one or two years old. This causes the heart of the tree to decay and ultimately leads to its death. The remedy seems to be to grow trees for the first few years in such a way that their trunks will be protected from hard winter freezing. Another plan is to grow Siberian crab apples until a good-sized tree has been obtained, then top graft with the desired standard apple. During these ten years' growth not a single Siberian crab apple tree has been injured—growth starting from the terminal bud each spring. Unfortunately, the Siberian apple is so small—less than half an inch in diameter and tart, that it is not really useful other than as a stock to graft on. It, however, makes a lovely ornamental tree when in full bloom, and the apples make good jelly. It is pleasing to report that one tree of this variety has been found, the fruit of which makes a jelly the equal of the cultivated crab and suitable for table purposes. The apple is blood red in color, fully half an inch in diameter, and will be propagated for distribution. Some of the larger Siberian crab trees will be top grafted next spring with standard apples. This will furnish material for breeding work later on. A stock of young Siberian crab apple trees is being accumulated as stocks upon which to graft the various varieties of apples and also so that students may have practice in the actual work of budding and grafting. Three specially selected plum trees fruited for the first time and give promise of being worth while.

Nursery.

In the nursery is grown a supply of trees, shrubs and perennial flowers for setting out in the permanent plantings on the grounds. Each year new varieties have been added, and more will be added again next year for trial. The list of ornamental trees, shrubs and perennial flowers hardy and suitable for the province is steadily growing. Even now, more varieties are known to be hardy than it is possible to place in the grounds around the average home. There is quite a wealth of suitable plants.

Permanent Plantings.

There was no winter killing of any kind in the permanent plantings. In many instances these plantings are making really wonderful growth. Some of the elms are thirty feet high and only planted eleven years. More planting was done during the next year.

It is a pleasure to record the recognition given Mr. Harcourt the past spring by the Canadian Forestry Association, he being asked to undertake the work of lecturer and instructor on the instruction car operated by them through the southern portion of the province during the summer. It gave him an opportunity to see at first hand the progress that was being made in the planting of trees for protection and beautifying the home. Later he was asked to do the same thing through southern Saskatchewan and Manitoba. This gave him an opportunity to observe the progress that has been made by these settlements during the forty years. He had the opportunity of visiting the Dominion Fruit Station at Morden, Manitoba, where, in ten years' time, over eighty acres have been placed under fruit. Progress was truly amazing; in this ten years from planting the harvest of standard apples is 200 barrels and 300 barrels of crabs, as well as an abundance of small fruits. It looks as though the prophecy that the prairies will, in the very near future, grow their own fruit may be true.

Today, one is safe in saying that, where a good shelter belt exists to give protection, it is possible to grow strawberries, raspberries, currants, and some of the hardier crab apples. Not a few specimens, but enough to supply the family needs.

DEPARTMENT OF ENTOMOLOGY.

Courses Given and Attendance.

Entomology 1 (Junior), 2 hrs. lecture; attendance	28
Entomology 61 (Senior), 3 hrs. lecture, 3 hrs. lab; attendance	8
Entomology 63 (Senior), 6 hrs. lecture-lab.; attendance	1
	37

Insect Collections.

During the year much time has been expended upon re-arranging material in both the Reference Collection of the Albertan fauna and the General Working Collection. The former now contains considerably over half of the species recorded from this province, and the latter is now in a condition in which it is available for the use of senior students.

Owing to a general scarcity of insects during the summer of 1927, few additions have been made to either collection.

Library.

Few additions have been made to the library, which is still inadequate for the requirements of the senior students. A large appropriation would be necessary in order to bring it up to a working standard for investigational purposes.

Publications.

A revised edition of the University Bulletin upon Wireworms of Alberta has been prepared and published. The only other publications from this Department have been a few articles upon current problems for distribution by the Department of Agriculture, together with an article in Science Monthly upon the relation of birds to agriculture.

Extension Work.

About 15 addresses have been given to farmers' and other organizations. These dealt, for the greater part, with the sawfly menace.

Five radio talks on current topics were given during the winter.

Lectures were given also during the Farm Young People's Week in June and at the Short Course in February.

Conferences Attended.

An important conference of the workers upon the control of prairie inhabiting crop pests was attended at Saskatoon in September. Two papers were presented here by the Department. Much valuable information was obtained from the other representatives.

Investigational Work.

Wireworms.—The investigation, under the auspices of the National Research Council, upon the control of Wireworms, is proceeding. The greater part of the summer was devoted to standardizing a technique for employment with the incubators that were installed at the beginning of the season. It is hoped that accurate information upon the effect of variations in soil temperature and moisture upon the viability of the eggs will be obtained in 1928. During the present summer, on account of our inability to complete tests upon the rate at which soils take up and lose moisture under varying conditions, uniform temperature and moistures were employed during the early summer, at which time only eggs can be obtained.

A number of materials for seed treatment, which have received current approval as deterrents, were tested very carefully and repeatedly. None was shown to have any appreciable value in this connection, and several greatly retarded germination.

Mr. H. A. MacGregor, a senior student in Agriculture, assisted in this investigation.

Wheatstem Sawflies.—In co-operation with a number of farmers in the heavily infested area around Consort and Provost, a number of experiments were conducted upon the efficacy of various cultural methods for the reduction of losses by this pest. Standard control measures, which are advocated in neighbouring provinces, proved to be very disappointing when their effects were carefully tested in comparison with controls. Their failure may have been due, in part, to the exceptional climatic conditions that prevailed this spring, though this would appear to be improbable.

Our observations and experiments indicated that trap crops offered the greatest promise as a means of reducing sawfly damage.

Much more work is, however, necessary before we can place control measures upon a firm basis, and this Department has not the personnel necessary for undertaking this work.

General Insect Conditions in Alberta, 1927.

The spring of 1927 was unusually backward and wet throughout the province. This appears to have affected insect abundance markedly. It was very favourable to a great increase in the mosquito population, and to a less extent to gad-flies. Non-aquatic species of insects were, for the greater part, much reduced in numbers. Insect damage was below normal.

Grasshoppers.—No damage records from Alberta. Severe damage was anticipated in the Peace River district, and preparations were made to cope with the situation. During May 'hoppers emerged in devastating numbers from over-wintering eggs. Their appearance was followed almost immediately by a succession of heavy cold rains, which reduced their population to negligible proportions.

Cutworms.—Two wet springs in succession resulted in the complete absence of grain infesting cutworms, in injurious numbers, in any part of Alberta.

Army Cutworms.—Unlike the true cutworms, these insects increase in numbers as a result of wet weather in the fall. A marked increase in their numbers was recorded from the southern part of the province, but no serious losses were recorded.

Bertha Cutworms.—This somewhat alarming pest of dicotyledonous plants, such as flax, sweet clover, sugar beets and garden produce, caused serious losses in many parts of the province. Prior to 1925 it was considered to be a rare insect, but in recent years it has shown a steady annual increase. Its habits are not as yet fully known.

Wireworms.—Owing to the cool wet spring, actual feeding by wireworms was above the average. Uninjured plants, however, made an unusual growth while slightly damaged plants were able to recover. The damage recorded is below the average.

Wheatstem Sawflies.—Egg laying in wheat was probably more heavy in Alberta than it has ever been in former years. The wet spring, however, resulted in the majority of the larvae perishing in the straws. As a result the sawfly population has been greatly reduced, and there was little loss from this source.

Red Turnip Beetle.—In 1923 this insect extended its northern range to about 25 miles north of Edmonton. In 1927 the most northerly record was at Innisfail, about 130 miles farther south.

Mosquitoes.—Owing to a very slow evaporation of snow water in the spring and to persistent rains at this season, mosquitoes have been more abundant throughout northern Alberta than they have been in the memory of its present inhabitants. A similar season in 1928 is liable to produce really serious consequences since, in all probability, the number of over-wintering eggs is many times the normal. Golf clubs appear to have been, as yet, the greatest financial losers, though a rise in the price of milk and butter is attributable to their activities.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

The teaching work in this Department is divided into three branches: Farm Buildings, Farm Machinery and Farm Motors. At the present time there are 12, 18 and 5 students respectively in the three courses, while last session there were 11, 12 and 4 registered in the courses mentioned above. The Diploma students, six in number, are receiving a special course.

As in the past, the various machine companies are co-operating very closely with us in our efforts along educational lines in connection with the more efficient operation of all kinds of farm machinery. As far as space permits, we try to keep sufficient machinery in our laboratory for demonstration purposes. The various types of machines are changed throughout the winter as our needs demand. Samples of plow bottoms, display boards, and sections of bearings, etc., are supplied, and facilitate our work very considerably. Charts and lantern slides are also of great assistance to us. In connection with our work in gasoline engines and tractors, we have been fortunate in securing sectional engines, motors, and carburettors from the international Harvester Company, the Ford Motor Company of Canada, the Massey-Harris Company, the J.I. Case Threshing Machine Company, the Cockshutt Plow Company, and the Advance Rumley Company. We have several tractors in the laboratory each winter.

This equipment, along with the work taken up in detail, enables a student to gain a very practical knowledge of the machines used on the average farm. He should be able to advise farmers in his community about the different important features of the various makes of plows, tillage, seeding and harvesting machines, both horse and tractor drawn. He ought to be able to help his neighbors in harvest season, and advise them in connection with the solution of their power farming problems.

In addition to the teaching work, there is a considerable volume of correspondence, and approximately 1,200 letters have been sent out up to this date since January 1, 1927. During the winter months there are one or two callers almost every day. Some have listened in on the radio and want further information, others are seeking assistance in the purchase of field machinery, tractors, etc., while again others have inventions about which they wish advice.

Since January 1st of the present year I have given one or more addresses to over 2,500 students in attendance at the Power Farming Schools held by the various machine companies in the city of Edmonton, and have also assisted the Extension Department with one or two meetings in the country. Five talks were given over the radio. The bulletin (No. 6) on "Plows and Plowing" was revised and enlarged, and published in its third edition last spring. The Ropework Bulletin (No. 9) was reprinted also, and the demand for these bulletins seems to indicate that they are meeting a real need.

DEPARTMENT OF SOILS.

The research work of the Department was carried along the same lines as in 1926, except that certain extensions were found necessary in connection with some of the projects.

The various lines of work pursued were as follows:

1. Soil Survey.
2. Experimental work in soils (plot work).
3. Availability of plant-foods under field conditions (decomposition of the soil's organic matter).
4. Other research problems.
5. Analysis of miscellaneous samples: (a) Soil samples sent in by farmers, (b) alkali soil samples, (3) drainage waters.

1. During the summer of 1927 the regular field work of the soil survey was confined to the St. Ann Sheet. The total area surveyed in 1927 was smaller than in any previous year, owing first to the time required in making preparations for the visit of the delegates to the International Congress of Soil Science, and second, the time required to collect and prepare monolith samples of the major soils of Alberta.

On July 13th the delegates of the First International Congress of Soil Sciences, numbering over 200 and representing 30 different countries, visited the University and studied the soils in the vicinity of Edmonton. This visit left an extremely favourable impression upon the delegates, and should ultimately result in a very wholesome sort of advertisement for Alberta, which has been given special mention in reports to hand.

Monolith samples of soil from the brown belt, the transition belt, the black belt and the wooded belt were collected in duplicate. One set of these samples is on exhibit in the Parliament Buildings and the other in the laboratories at the University. They are almost invaluable as instructional and demonstration exhibits.

The third soil survey report, that of the Sounding Creek Sheet, is now in the hands of the printer and will soon appear as Bulletin 16. This covers an area of approximately 2¾ million acres adjacent to the Goose Lake Branch of the C.N.R. extending from Hanna to Alsask. This, together with the Macleod and Medicine Hat Sheets, will bring the areas for which reports are prepared up to almost 8 million acres.

The field work and analytical work for half of the St. Ann Sheet is almost completed, and the report should be ready late in 1928.

2. The wheat yields from the Experimental plots were higher than for 1925, but the percentage variation for the different plots is about the same as for previous years. This will necessitate the continuation of this study for several years before fertilizers can be applied to certain of the plots.

3. The routine work in connection with the investigation on the availability of plant foods under field conditions was largely discontinued, and special phases of this work was expanded, such as the periodical fluctuation in nitrate accumulation and disappearance.

A co-operative project, in connection with the Department of Field Crops, to determine the effect of various grasses and legumes upon the production and quality of subsequent cereals was started early in 1927. This project will probably require five years for its completion.

4. Other research problems pursued during the years are enumerated below:

(a) Possible plant food deficiencies in Wooded Soils of Alberta.

Preliminary work in the nature of pot cultural experiments has been carried on for the past three years, with very promising results (as indicated by the following tabulated summary), but before it would be safe to offer general recommendations to farmers regarding this wooded soil, it would require at least five years' results under actual field conditions.

CROP YIELDS AFFECTED BY FERTILIZERS APPLIED TO WOODED SOILS.

(Relative Yields, Check Equals 100)

TREATMENT.

	None	Manure	Nitrogen	Lime	Phosphate	Lime and Phosphate	Comp. Fertilizer	Potash	Sulphur
2 crops: Barley, grain	100	119	128	133	141	150	161	98	102
2 crops: Barley, straw	100	126	132	126	139	155	179	87	81
1 crop: Wheat, grain	100	116	122	151	164	164	141	....	....
2 crops: Wheat, straw	100	123	127	139	147	157	152	....	....
2 crops: Sweet clover	100	113	105	119	127	148	106	....	....
Av. increase due to treatment, per cent	....	19	23	34	44	55	48	....	....

We cannot make general recommendations for the treatment and management of these soils without first procuring the necessary field data. Thus we feel that this work should be undertaken at the earliest possible date, otherwise the demand, as at present, will be far in advance of the necessary information.

(b) Possible symbiotic Fixation of Nitrogen by Non-leguminous plants.

(c) Sulphur content of Alberta Soils.

(d) Variation in Reactions of Alberta Soils.

(e) Characteristics of Typical Soil Profiles in Alberta.

(f) Biological Activities in Soil from Different Parts of Alberta.

(g) Respiration and Nutritive Relationships as Affecting Plant Growth.

(h) Fertilizer Deficiencies in Peats.

Sufficient progress has been made on the following projects: (a), (c), (d) and (e) to justify the preparation of journal papers.

5. The services in connection with the anlyses of samples of soil, alkali and drainage waters have been continued throughout the year.

The following contributions from the Department of Soils have been published in 1927:

"Variations in Plot Fields due to Soil Heterogeneity," by F. A. Wyatt, in Sci. Agr., Vol. VII, No. 7, Mar., 1927.

"Nitrate Production Under Field Conditions in Soils of Central Alberta," by F. A. Wyatt, A. S. Ward and J. D. Newton, in Sci. Agr., Vol. VII, No. 10, June, 1927.

The following paper has been accepted, but has not yet appeared in print: "Alberta Soil Profiles," by F. A. Wyatt and J. D. Newton, to be published by The Proceedings of First International Congress of Soil Science. (Abstract of above paper published in June, 1927.)

"Soil Survey of Sounding Creek Sheet," by F. A. Wyatt, J. D. Newton and J. A. Allan, with T. H. Mather, J. L. Doughty and A. S. Ward assisting. Bulletin 16, Dec., 1927, University of Alberta.

NOTE: The Department of Agriculture co-operated as usual in the work of the Soil Survey by financing the field operators. The Minister of Agriculture also arranged to send Dr. Wyatt to the World Congress at Philadelphia.

NOTES.

1. Members of our staff have given lectures at different parts of the province as arranged by the Director of the University Extension Department.

2. Members of our staff have taken part in conferences and meetings arranged by the Provincial Department of Agriculture.

3. A large number of lectures have been given on request by members of our staff. There were more requests than could possibly be complied with. There is a definite need for more staff assistance in order to meet the steadily growing demand.

4. Our Professors contributed to a definite Agriculture Radio Programme put on under the direction of the Extension Department, giving one lecture each week on Farmers' night. This year the service has been doubled. A copy of the Radio Programme is given at the end of this report.

5. A heavy correspondence is maintained throughout the year on technical subjects, answering questions sent in by farmers from all over the Province.

6. The success of our live stock exhibits at the Toronto Royal and the Chicago International has been very gratifying this year. Our system of securing contributory exhibits has, we feel, resulted in benefit to the University and to the breeders of the province.

The following list of Bulletins have been issued under the auspices of our Publications Committee:

Bulletin No.
1. Roughages for Wintering Pregnant Ewes.
2. Growing Sweet Clover.
3. Growing Registered Seed in Alberta.
4. Altaswede Red Clover.
5. Potato Diseases.
6. Plows and Plowing.
7. The Production of Fall Pigs in Alberta.
8. Oat Silage vs. Sunflower Silage for Fattening Steers.
9. Ropework for the Farm.
10. Binder and Knotter Troubles.
11. Soil Survey Report of Macleod Sheet.
12. Age as a factor in the Profitable Feeding of Steers.

Circular No.
2. Howes' Alberta Flint Corn.
3. Steer Feeding in Alberta.
4. Legume Inoculation.

Research Bull. No.
1. The Nature and Practical Measurement of Frost Resistance.
2. Wireworms of Alberta.

Many of these Bulletins have had a wide circulation and have secured high rating from outside authorities. We would call attention to the fact that these Bulletins are almost wholly made up of reports upon work resulting from our direct investigations and experiences. Our college still holds a high place throughout Canada and elsewhere for the calibre of this work, hence the high rating of these publications.

RADIO PROGRAM FOR FARMERS' NIGHT

1927—

Nov. 24—E. A. Howes: Review of Programme.

Dec. 1—W. H. Cook: Some Problems Related to the Commercial Drying of Wheat. Dr. C. P. Marker: Alberta's Dairy Industry.

Dec. 8—Dr. J. D. Newton: Soil Population and its Industry. Prof. E. H. Strickland: Causes of Insect Outbreaks.

Dec. 15—Prof. J. Macg. Smith: A Tale of Yesterday, Today and Tomorrow. Dr. C. P. Marker: Marketing of Dairy Products.

Dec. 22—J. M. Manson: Wheat Quality in Relation to Combine Harvesting. R. D. Sinclair: Giving the Fall Pigs a Chance.

Dec. 29—Prof. G. Harcourt: Winter Care of House Plants. Prof. J. P. Sackville: Alberta Livestock at the 1927 Eastern Shows.

1928—

Jan. 5—A. S. Ward: How Plants Feed. Dean Howes: Short Course Announcement.

Jan. 12—Dr. C. P. Marker: Quality in Dairy Products. Prof. J. Bowstead: Efficient Winter Dairy Rations.

Jan. 19—Dr. A. W. Henry: Diseases of Field Crops. W. J. Stephen: Registered Seed.

Jan. 26—Dr. P. R. Talbot: Diseases of Sheep. Prof. E. H. Strickland: Principles of Insect Control.

Feb. 2—T. H. Mather: Soil Problems of Older Agriculture. Prof. J. P. Sackville: Beef Cattle Outlook for 1928.

Feb. 9—Dr. D. MacGibbon: Co-operative Marketing. Dr. A. W. Henry: The Menace of Cereal Root-rot.

Feb. 16—Prof. J. Macg. Smith: Power Farming I. Dr. D. MacGibbon: Co-operative Marketing.

March 1—A. Leahey: How Plants are Made. Dr. D. MacGibbon: Co-operative Marketing.

March 8—J. A. Anderson: How Plants Fight Their Disease Enemies. Prof. J. Bowstead: With the Flock at Lambing Time.

March 15—Prof. Geo. Harcourt: How to Make and Care for Hot Beds. Prof. E. H. Strickland: Some Common Garden Insects.

March 22—Dean Howes: History of Agriculture. Prof. J. Macg. Smith: Plows—Their Operation and Adjustment.

March 29—A. E. Clarke: Fighting Crop Diseases by Plant Breeding Methods. Prof. J. Macg. Smith: Better Plowing.

April 5—Dr. F. A. Wyatt: The World's Fertilizer Trade. Prof. J. P. Sackville: Year's Progress in Solving Livestock Problems.

April 12—Prof. G. Harcourt: Suggestions for Kitchen Flower Garden. Prof. E. H. Strickland: Shade Tree Insects.

April 19—Prof. J. Fryer: Agricultural History of Alfalfa. Deputy Minister Craig.

April 26—Prof. E. H. Strickland: Can We Forecast Insect Outbreaks? Prof. G. Harcourt: Small Greenhouses.

May 3—Prof. G. Harcourt: Fruits for the Home Garden. Prof. R. D. Sinclair: Feeding in Relation to Ultimate Bacon Type.

May 10—Dr. C. P. Marker: Butter-making in the Home Dairy. W. J. Stephen: Weed Control.

May 17—Dr. P. R. Talbot: Diseases of Swine. D. Chalmers: Bee Culture.

May 24—Dr. C. P. Marker: Helpers in the Dairy Business. Dean Howes.

May 31—Prof. G. Harcourt: Weedless Lawns. D. Chalmers: Bee Culture.

A question and answer bureau is carried on through the radio.

Respectfully submitted,

E. A. HOWES, Dean.

PART II.

Financial Report

UNIVERSITY OF ALBERTA.

BALANCE SHEET

ASSETS

	March 31, 1928.	Dec. 31, 1927.
CAPITAL ACCOUNT:		
Land, Buildings and Plant	$3,545,923.31	$3,545,920.20
Hospital Buildings	153,000.00	153,000.00
Furnishings and equipment	648,799.81	646,794.22
Livestock	32,095.10	33,164.35
Bond Discount and Expense	392,713.36	395,205.97
Due from Income Account	22,900.01	26,639.67
	$4,795,431.59	$4,800,724.41
INCOME ACCOUNT:		
Cash	$ 4,207.59	$ 3,591.93
Accounts Receivable	33,627.97	47,409.81
Inventories	70,418.17	71,288.92
Accrued Interest—Rockefeller Foundation	3,125.00	....
Unexpired Insurance	4,840.00	6,529.70
Prepaid Pensions	2,828.73	....
Advances to University Hospital	203,629.96	185,636.60
Deficit:		
From previous period	$ 17,081.46	$ 15,305.78
For current period	19,737.83	1,775.68
	$ 36,819.29	$ 17,081.46
	$ 359,496.71	$ 331,538.42
TRUST ACCOUNT:		
Securities	$ 505,196.45	$ 505,329.80
Loans Receivable	1,703.50	1,703.50
Cash	34,801.25	61,907.35
	$ 541,701.20	$ 568,940.65
	$5,696,629.50	$5,701,203.48

LIABILITIES

CAPITAL ACCOUNT:		
Debenture Debt: University	$ 450,000.00	$ 450,000.00
Hospital	150,000.00	150,000.00
	$ 600,000.00	$ 600,000.00
Province of Alberta	4,135,050.81	4,136,092.81
Accounts Payable	241.43	4,492.25
Library Fees Unexpended	4,328.17	5,222.62
Capital Surplus	55,811.18	54,916.73
	$4,795,431.59	$4,800,724.41

INCOME ACCOUNT:		
Imperial Bank of Canada Loan	$ 150,000.00	$ 200,000.00
Imperial Bank of Canada Overdraft	152,123.36	42,502.46
Accounts Payable	31,880.04	58,602.36
Room and Board, paid in advance	2,593.30	3,793.93
Due to Capital Account	22,900.01	26,639.67
	$ 359,496.71	$ 331,538.42
TRUST ACCOUNT:		
Rockefeller Foundation	$ 500,000.00	$ 500,000.00
Sundry Trusts	41,701.20	68,940.65
	$ 541,701.20	$ 568,940.65
	$5,696,629.50	$5,701,203.48

Edmonton, July 24, 1928.

I have audited the books and accounts of the University of Alberta for the fifteen months ended March 31, 1928, and the above Balance Sheet and Revenue and Expenditure Statement are in accordance therewith. Capital assets are shown at book value and accounts receivable are subject to realization.

I certify that, in my opinion, the above Balance Sheet is properly drawn up so as to exhibit the financial position of the University on March 31, 1928, and the annexed Revenue and Expenditure Statement sets forth the result of operations for the fifteen months ended at that date.

JAMES C. THOMPSON, C.A.,
Provincial Auditor.

UNIVERSITY OF ALBERTA.

STATEMENT OF REVENUE AND EXPENDITURE FIFTEEN MONTHS ENDED MARCH 31, 1928

REVENUE

	Three months ended March 31, 1928.	Year ended Dec. 31, 1927.
Province of Alberta:		
Grant	$ 125,000.00	$ 448,900.00
Grant for Debenture Interest and Charges	55,542.43	222,169.74
	$ 180,542.43	$ 671,069.74
Rockefeller Foundation	6,250.00	25,000.00
Fees	3,419.40	102,011.63
Rentals	9,326.54	27,695.05
Dining Room	2,999.52	5,373.26
Printing Department	1,280.05	7,833.76
Bookstore and Post Office	544.81	3,857.61
Garage Rent	355.00	1,562.50
	$ 204,717.75	$ 844,403.55

EXPENDITURE

Salaries:		
Total Salaries and Wages	$ 148,718.38	$ 579,980.36
Less: Charged to Departments	67,094.01	248,605.01
	$ 81,624.37	$ 331,375.35
Debenture Interest and Charges	55,542.43	222,169.74
Agriculture	30,542.08	104,713.45
Laboratories	17,318.87	51,529.24
Light, Heat and Power	10,780.13	35,991.13
Maintenance and Repairs	9,285.30	34,977.48
Department of Extension	6,429.02	22,928.22
Insurance	1,753.70	6,695.77
Bank Interest	528.48	6,597.76
Calendars, Press Bulletins, etc.	625.54	4,852.16
Teachers' Courses	1,159.98	4,580.00
Summer School	100.00	3,800.00
Printing and Stationery	905.26	3,498.26
Telegraph and Telephone	1,060.82	2,045.32
Sundries	1,034.60	2,020.12
Library	792.49	1,987.53
Outdoor Clinic	1,336.94	1,888.76
Travelling Expenses	355.00	1,517.30
Upkeep of Motor Cars	174.75	1,103.04
Postage and Excise Stamps	183.48	871.56
Physical Education	23.31	787.49
Typewriter Inspection and Repairs	70.30	196.55
Scholarships and Medals	....	53.00
Pensions	2,828.73	....
	$ 224,455.58	$ 846,179.23
Net Deficit for period	$ 19,737.83	$ 1,775.68

UNIVERSITY OF ALBERTA HOSPITAL.

BALANCE SHEET

ASSETS

	As at Mar. 31, 1928.	As at Dec. 31, 1927.
ACCOUNTS RECEIVABLE:		
Dominion of Canada (S.C.R.)	$ 22,406.98	$ 11,116.92
Province of Alberta	26,394.36	17,002.16
City of Edmonton	2,950.77	9,859.77
Civilian Patients	$ 236,386.09	$ 225,715.42
Less: Reserve for Bad Debts	199,703.66	188,036.66
	$ 36,682.43	$ 37,678.76
	$ 88,434.54	$ 75,657.61
INVENTORIES	$ 13,736.39	$ 12,850.00
UNEXPIRED INSURANCE	$ 878.02	$ 1,117.00
CASH	$ 101.01	$ 1,178.76
HOSPITAL BUILDINGS:		
Buildings	$ 150,000.00	$ 150,000.00
Building Fixtures	10,733.89	9,937.61
Robertson College	800.00	800.00
	$ 161,533.89	$ 160,737.61
EQUIPMENT	109,085.98	107,488.34
Less: Loaned by Dominion Government	62,378.20	62,378.20
	$ 46,707.78	$ 45,110.14
SUSPENSE	$ 441.21	
DEFICIT:		
Balance from previous period	$ 62,217.26	$ 66,405.52
Add: Net deficit for period	5,041.89	4,188.26
	$ 67,259.15	$ 62,217.26
	$ 379,091.99	$ 358,868.38

LIABILITIES

	As at Mar. 31, 1928.	As at Dec. 31, 1927.
DEBENTURE DEBT	$ 150,000.00	$ 150,000.00
ACCOUNTS PAYABLE	200.25	10.00
ACCRUED INTEREST ON DEBENTURES	1,875.00	....
EQUIPMENT RESERVE—DONATIONS	19,216.67	19,051.67
PROVINCE OF ALBERTA—CAPITAL ADVANCES	4,170.11	4,170.11
UNIVERSITY OF ALBERTA	203,629.96	185,636.60
	$ 379,091.99	$ 358,868.38

Edmonton, July 12, 1928.

I have audited the books and records of the University of Alberta Hospital for the fifteen months ended March 31, 1928, and find that the above Balance Sheet and accompanying Revenue and Expenditure Statement are in accordance therewith.

I certify that, in my opinion, the above Balance Sheet is drawn up so as to exhibit the financial position of the University Hospital on March 31, 1928, and the annexed Revenue and Expenditure Statement sets forth the result of operations for the fiscal period ended at that date.

JAMES C. THOMPSON, C.A.,
Provincial Auditor.